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MULTIMEDIA EXPLOSION
What It Means — And How It Will Change the Way You Work

DATA BASE SATISFACTION
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46 PROGRAMS FOR THE PROFESSIONS
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Normal

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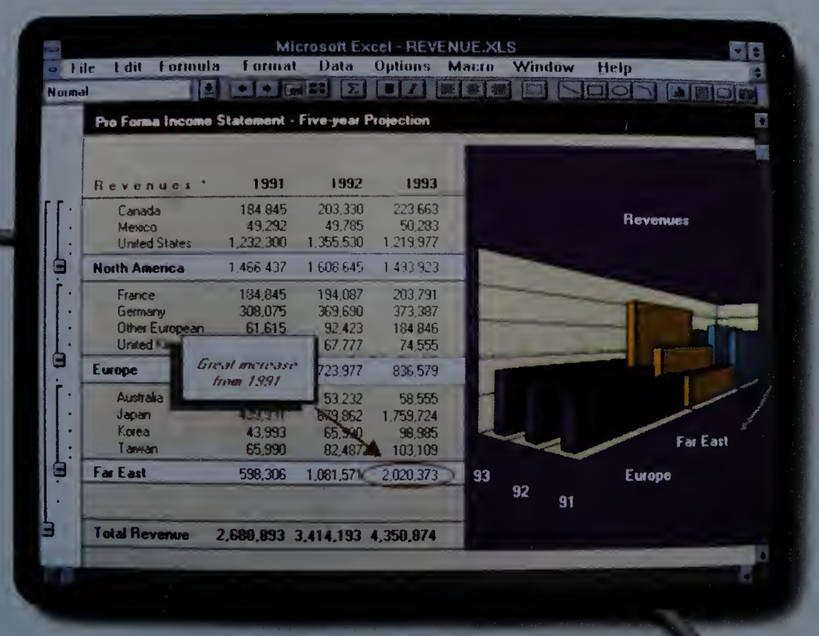

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Canada	184,845	203,330	223,663
Mexico	49,292	49,785	50,283
United States	1,232,300	1,355,530	1,219,977
North America	1,466,437	1,608,645	1,493,923
France	184,845	194,087	203,791
Germany	308,075	369,690	373,387
Other European	61,615	92,423	184,846
United [illegible]	[illegible]	67,777	74,555
Europe	[illegible]	723,977	836,579
Australia	[illegible]	53,232	58,555
Japan	[illegible]	869,862	1,759,724
Korea	43,993	65,990	98,985
Taiwan	65,990	82,487	103,109
Far East	598,306	1,081,571	2,020,373
Total Revenue	2,680,893	3,414,193	4,350,874

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VOLUME 9, NUMBER 5

PC WORLD

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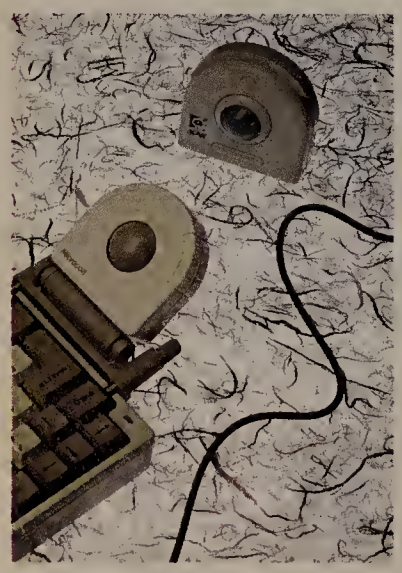

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Cover design by Bill Jensen
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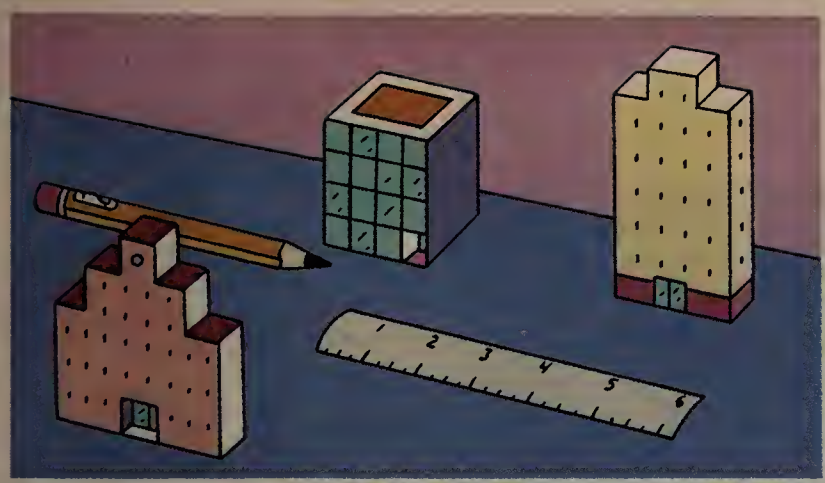

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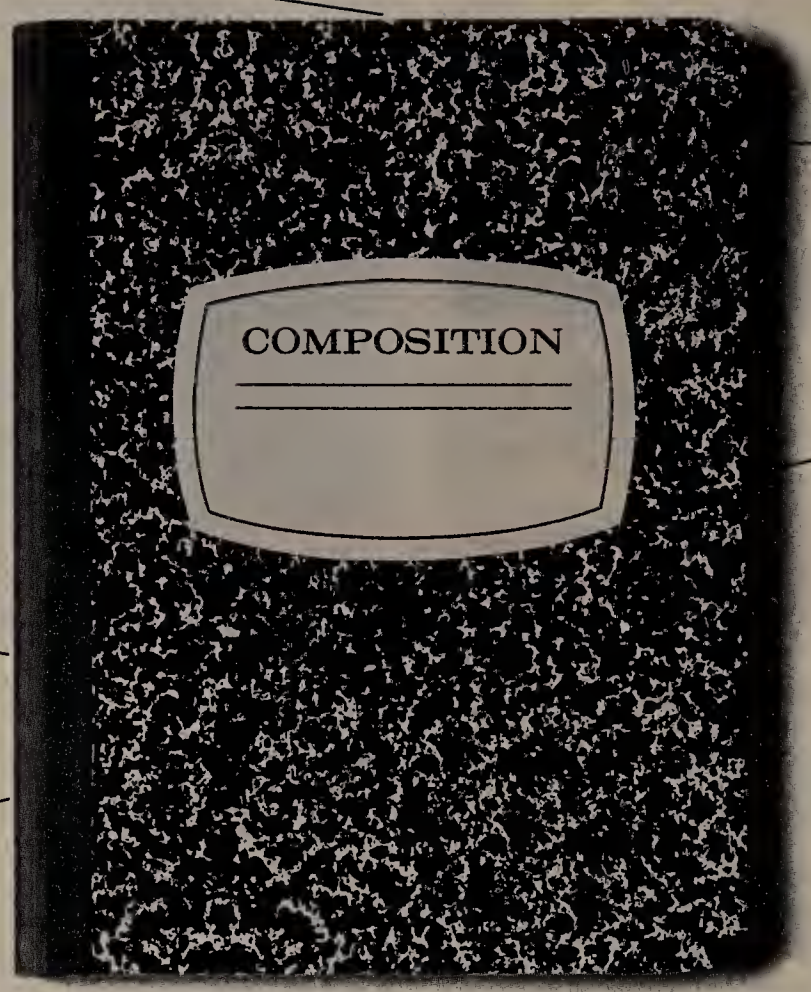

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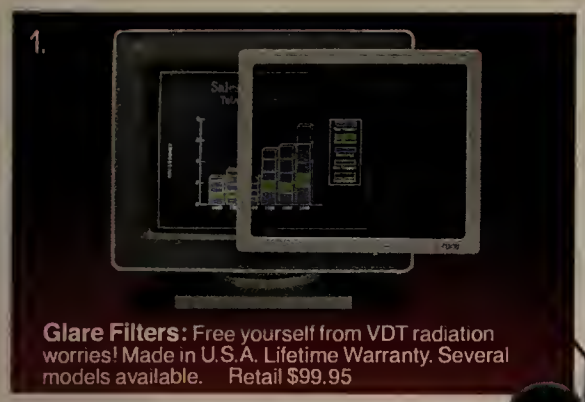

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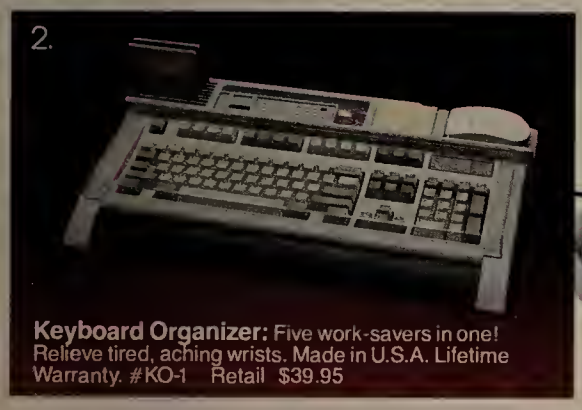

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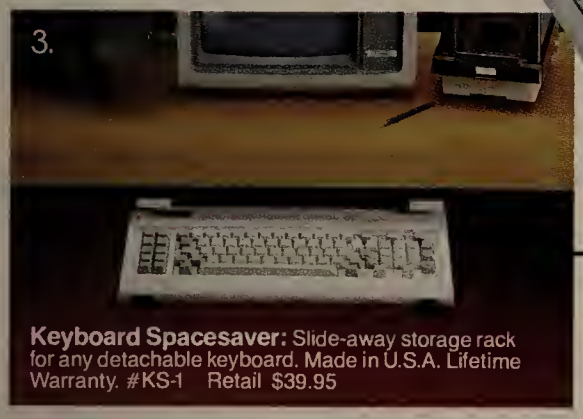

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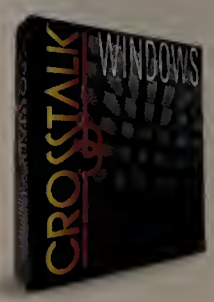

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Circle 62 on reader service card

Author TJ Byers (left) and Associate Editor Michael Goodwin flank Zeos's Best Buy notebook.

ROBERT CARDIN

Laptop Lifeline

For Associate Editor Michael Goodwin, the editor of this month's cover story on SX notebooks, portable computing suddenly became, as he puts it, "a lifeline." Mike was scheduled to write the notebook article himself. But last winter a motorcycle accident left him in the hospital for a month with a badly injured foot. One of the first things Mike asked for (after a plea for some noninstitutional food) was—you guessed it—his laptop.

A true PC addict, Mike says he felt immensely better as soon as he managed to set up the laptop and log on to E-mail. Back at the office, we were reassured to hear from Mike about his recovery and sent back many messages of encouragement.

With Mike still recuperating, we turned to longtime contributing editor TJ Byers, who gamely stepped in at the last minute to write the roundup. TJ comes from a hard-core electronics engineering background (in the mid-1960s, TJ was a junior engineer on NASA's Surveyor project). However, both editors take the user's view when it comes to evaluating hardware.

TJ has no problem turning a laptop inside out to see what makes it tick, right down to the component level. But with all of today's cutting-edge notebooks offering enough performance, memory capacity, and hard disk storage for even *Windows* applications, TJ believes the most important buying criterion is simple: "It just has to feel right. By that, I mean the keyboard and the screen." Mike agrees, with the accent on the keyboard; the closer a laptop keyboard comes to desktop-style layout, the happier Mike gets.

Both editors also put service and support high on the list. According to TJ, on-site service isn't as vital with notebooks as it is with desktop PCs because "there's nothing a repairperson can fix." All the vendors offer a better alternative: "If something fails, you can call the company, give them your credit card number, and they'll overnight you a new system. Most companies will also try to recover data off the failed system when you send it back."

The Zeos Notebook 386, the sleek black notebook on our cover, offered the best balance of feel, service, price, and performance, earning it a Best Buy. Still, TJ has a wish list for future notebooks and some pretty shrewd predictions of what's to come.

"One thing I'd like to see is a standard notebook expansion slot," says TJ. "For notebooks to really replace desktops, you need a wide selection of boards so you can add special capabilities when you need them." And of course, there's color. "It'll be a while before you get color in a battery-powered notebook. The color display's power consumption is just too high."

Engineers are already working on this problem, TJ says, reducing power requirements overall by consolidating as many components as possible onto a single chip. This new level of integration will also provide greater reliability—and even lighter, thinner notebooks, which will probably arrive late this year. As TJ says, "The more mobility the better."

Mike Goodwin, now back in the office and mobile himself, couldn't agree more. His laptop lifeline was "a 17-pound dinosaur. There wasn't a day when I didn't pray it would magically transform itself into a 7-pound notebook. Every ounce counts!"

Eric Knorr
Editor

Some days you have all the time in the world.

When the pressure is on, pour on the speed. With Hewlett-Packard's new LaserJet IIISi printer. A powerhouse that delivers at a throughput speed of 17 pages per minute.

With the LaserJet IIISi, you're up to speed the moment you give the "print" command. HP's RISC-based formatter and the PCL5 printer language, with vector graphics and on-the-fly typeface scaling, yield fast results. This printer also represents a new standard for I/O performance with optional Network Printer Interface cards for either Ethernet or Token Ring.

The LaserJet IIISi is specifically designed for shared-use environments. Its high-volume paper handling features include two 500-sheet input trays and a monthly duty cycle of 50,000 pages. HP offers software-selectable language switching between PCL5 and optional Adobe® PostScript.® For added versatility, your options include

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And some days you need the new 17ppm LaserJet IIISi.

an envelope feeder and two-sided printing.

Beyond speed and efficiency, the LaserJet IIISi delivers the sharpest 300 dpi print quality yet. In fact, HP's revolutionary combination of Resolution Enhancement technology and new microfine toner challenges the print quality of many 600 dpi printers.

The price of the new LaserJet IIISi, just $5,495,* is as impressive as the work load it handles. If you're ready to pick up the pace, call **1-800-752-0900, Ext. 2067** for more information on the fastest LaserJet printer and the name of your nearest authorized HP dealer.

HEWLETT PACKARD

*Suggested U.S. list price. ©1991 Hewlett-Packard Company PE12101

Circle 114 on reader service card

LANtastic's™ tiny RAM now has more cards to play with.

If the presence of Micro Channel machines has ever stood between you and the joy of running the award-winning LANtastic PC Network, this is your lucky day. Artisoft has just added three new Micro Channel adapters to its compliment of AE-2 Ethernet, 2Mbps and Voice adapters.

PC MAGAZINE EDITORS' CHOICE March 28, 1989 LANtastic

LANtastic AE-2 MC Ethernet for Micro Channel, a 16-bit adapter that can be used in either a 16-bit or a 32-bit slot, is in 100% compliance with IEEE 802.3 and Ethernet standards, and comes with on-board 16K RAM that is user expandable to 64K. Since AE-2 MC Ethernet is software compatible with Novell's NE/2000 hardware, you can run Novell "out of the box."

PC MAGAZINE EDITORS' CHOICE May 29, 1990

LANtastic 2Mbps MC adapters are the perfect way to economically network small or midsize businesses with Micro Channel computers. Each card includes a 10Mhz coprocessor and 32K of on-board dual-ported RAM, along with software-selectable IRQ and RAMBASE address settings. Artisoft's version of the NetBIOS standard can be loaded into and executed within the adapter. This plunges the NetBIOS draw on a PC's base RAM down to just 2K and off loads the network processing onto the adapter. The cards are easy to install and use inexpensive dual-twisted pair cable.

LANtastic Voice MC adapters let you save sound and speech onto disk for playback later on Micro Channel machines. Use them with LANtastic NOS 3.0 or above, and you can send voice messages across your LANtastic network. Just pick up the telephone handset provided with each Voice Adapter, bring up a handy on-screen menu, and talk. Use Voice Chat to carry on a real time conversation, or save the message for playback later in your own voice – either through the handset or through the Micro Channel machine's internal speaker.

PC WORLD BEST BUY

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Circle 18 on reader service card

ADOBE FLEXES FONTS

Multiple Masters Solve Document Problems

Imagine buying a single PostScript type font and being able effortlessly to modify its weight, width, style, and size. Adobe's Multiple Master technology promises just this freedom—with big payoffs for users who create documents, fit them on a page, and share them.

In the past, each PostScript Type 1 font has been scaled from a single "master" font. Adobe's new extension of Type 1 lets font houses incorporate two or more masters and generate fonts by mathematically interpolating between the masters—for example, between a font optimized for very small size and another optimized for very large size. Adobe expects to offer these fonts for *Windows* and the Mac this summer; they'll work on all existing PostScript hardware and software.

Multiple Master technology gives graphic artists new opportunities and saves disk space because a single font can generate a huge range of type. It also solves nagging problems like the worksheet or letter that doesn't quite fit on one page—you can condense or expand type to fit the space without lowering type quality.

But the biggest benefit, says Adobe chairman John Warnock, is that users who may not have fonts in common will be able to share documents. With Multiple Master support, your software can automatically generate a compatible font, so the document a co-worker sends you prints out correctly the first time. Publishing maven Jonathan Seybold calls Multiple Masters a "landmark" in typography.

Although Apple and Microsoft haven't announced a similar capability for their rival TrueType technology planned for *Windows 3.1* this fall, analysts expect it. Adobe's technology "is pretty cool," says Dennis Adler, manager of Microsoft's effort. "We can see how this can be done in TrueType, although I don't envision [it] coming out really soon."

MICROSOFT BUYS E-MAIL

Consumers Software Fills a Strategic Need

Microsoft has filled one of the last major gaps in the industry's broadest application line by acquiring the assets of Consumers Software, maker of the electronic-mail package *The Network Courier*.

The software giant takes over *Network Courier* versions for DOS, *Windows*, OS/2, and Macintosh networks. Microsoft will evolve an integrated client-server architecture that emphasizes X.400 services on PC servers and *Windows* on workstations and merge in *Microsoft Mail* for the Macintosh.

A *Windows* version of *The Network Courier 2.1*, expected in April under the Microsoft label, will help Microsoft push its *Windows* line as an integrated suite, notes office systems vice president Jeff Raikes. Then the technology will be broadened to perform other functions in "mail-enabled" applications. "People have used mail to send messages between users," says Raikes. "Ultimately it will be a store-and-forward mechanism for moving objects between systems."

The deal comes hard on the heels of Lotus's acquisition of E-mail leader cc:Mail and is applauded for many of the same reasons. International Data Corporation analyst David Atlas says Consumers' technology and Microsoft's marketing presence make a good combination for capitalizing on a large market opportunity: IDC predicts the world's 3.7 million LAN E-mail boxes will skyrocket to 47 million by 1995. "Messaging will be part of almost everything you need to do," predicts Eric Arnum, editor of the *Electronic Mail and Micro Systems* newsletter.

As demands for capabilities like image handling and fax gateways expand, "the independent suppliers with 15 programmers will be hard-pressed to keep up," adds Arnum. "Lotus and Microsoft have the staff and the willingness to do everything." Small suppliers also lack presence in international markets, where Lotus and Microsoft will lock horns this year.

GORDON STUDER

TANDY SHOWS CHEAP CD ROM

Boost to Multimedia

Tandy Corporation has announced the first low-priced CD ROM drive that meets the basic Multimedia PC requirements established last year. Unveiled in March, the Tandy CDR-1000 lists for just $399.95. The low price and fast data transfer speed make the drive significant, says Nick Arnett, chief analyst for Multimedia Computing. "Tandy will be a leader in setting the pricing of future products," predicts Arnett.

While the internal drive has a relatively slow seek time, it has a sustained data transfer rate of 150KB per second—roughly twice the effective transfer rate of comparably priced drives. That's particularly important when dealing with storage-hungry data types such as audio, video, and animation. Correctly structured applications that reduce seeks among data tracks will be able to take advantage of the fast transfer rate of the low-priced platform, says Radio Shack's Ed Juge.

Cheap CD ROM drives are critical to getting multimedia computing off the ground, and a raft of new drives is sure to follow the Tandy announcement, predicts Arnett. Several hardware and software products have been held up by delays in the release of Microsoft's multimedia extensions to *Windows 3.0*, which provide the software foundation for Multimedia PCs and are not expected out until the middle of the year. "We'll see a significant number of announcements once the extensions ship," says Arnett.

PALMTOP COMPUTER COMING

HP, Lotus Team Up on New Product Type

Hewlett-Packard's Corvallis, Oregon–based calculator division and Lotus Development are reportedly planning the late April introduction of a new class of PC—one occupying the ground between pocket organizers like the Sharp Wizard and notebook PCs. Although not much larger than a Wizard and relying on the same solid-state storage and memory, the new product, code-named Jaguar, is said to be far more capable.

The DOS-compatible PC is based on an NEC processor running about two and a half times as fast as an XT. Jaguar is expected to sell for under $800 and will come equipped with the new DOS 3.22 as well as with *1-2-3* and a Lotus-designed set of desktop utilities in ROM.

Sources familiar with the product say this 11-ounce PC has a slightly smaller, sleeker profile than Poqet Computer's Poqet PC, plus a similar non-backlit, 40-character display and QWERTY keyboard. Like the Poqet, Jaguar folds up to fit in a suit coat or purse and provides more than 60 hours of operation on two penlight batteries.

However, Jaguar is not meant to be a laptop replacement, as the Poqet was originally billed. Instead, it is intended for executives, managers, and salespeople who may need to download and alter a spreadsheet or report during a meeting or sales call and to keep up with their E-mail on the go. Jaguar is expected to gain impetus from the installed base of 14 million *1-2-3* users, whose ranks are increasing at the pace of 100,000 a month.

Meanwhile, Poqet director of marketing/communications Jerry Purdy reports that this is precisely the market into which the Poqet PC has migrated during the past year and that agreement among vendors on solid-state storage media standards has significantly increased the availability of low-cost storage and ROM applications for this class of machine.

COMPAQ SUES DELL OVER ADS

Texas PC Leaders Start Shoot-Out in U.K. Corral

Is it valid to compare the price of a mail-order PC with the list price of one sold through dealers? That's one of the issues to be aired in a United Kingdom lawsuit that Houston-based Compaq Computer has filed against rival Dell Computer of Austin.

Compaq claims Dell's ads in U.K. journals are "deceptive and misleading." A similar U.S. ad describes a $3899 Dell 325D as "top of the mark" while calling the comparably configured Compaq Deskpro 386/25 next to it "top of the mark-ups." But Dell quotes a $7499 list price for the Deskpro, complains Compaq spokesman John Sweney, when it knows dealers always sell for a lot less. (International Data Corporation's PC street price survey shows discounts of up to 42 percent on Compaq models—before customers begin haggling.)

Such broad comparisons overlook many Compaq features and engineering pluses, says Sweney, who adds that businesses willingly pay more for a Deskpro because of Compaq's reputation for compatibility, reliability, and service.

Dell CEO Michael Dell defends the ads, noting that computer press reviews find Dell's lower-priced products "equivalent and often superior in overall performance, quality, reliability, and customer satisfaction. We find it interesting that Compaq has chosen to file a claim only now, when we have become larger, more successful, and apparently more of a competitive threat."

With 1990 sales of $546.2 million, Dell has become one of the most successful PC suppliers in any channel. The $3.6 billion Compaq is not threatened, but analysts give Dell ads partial credit for Compaq's decision to provide direct service to end users.

At press time, Compaq had not yet filed U.S. charges, but there are precedents for it under U.S. law, says Esther Roditti Schachter, a New York computer law specialist.

IS MICROSOFT PLAYING FAIR?

Cooperation Between Systems, Applications Divisions Draws Complaints From Developers

Microsoft is being investigated by the Federal Trade Commission for possible antitrust violations, although the FTC has not yet released the bill of particulars.

Microsoft believes the investigation is an outgrowth of a November 1989 press release about an agreement between the Redmond, Washington, software giant and IBM to limit the utility of *Windows* in order to differentiate between uses of DOS/*Windows* and OS/2, IBM's favored systems solution. If that is true, the investigation will close quickly because *Windows* has been a runaway success and OS/2, to date, a dismal failure.

But developers say they hope the FTC is looking into the close cooperation between the Microsoft Systems and Applications Divisions. They allege that Microsoft uses its virtual system software monopoly to advance its applications sales at the expense of its competitors and system clients.

Developers asked for anonymity because of their nearly complete reliance on Microsoft for system software direction and assistance, but they provide a litany of complaints about advantages enjoyed by Microsoft Applications. Most proceed, say these competitors, from Microsoft's habit of developing what ostensibly are systems advances such as OLE (Object Linking and Embedding) in the Applications Division, hard-coding them into Microsoft applications, and then releasing the specs to its systems clients too late for them to bring their own applications to market in the same time frame as, say, *Microsoft Word* or *Excel*.

"Somehow there seems to be a strong synchronization between what their system group proposes and what their application group is about to announce," complains one large developer. "Is the end user served by negative competition of that sort?" asks another. "Does that generate innovation or slow innovation?"

The competitive imbalance grows keener, say developers, as they are forced to give up on OS/2 and sign onto Microsoft's DOS/*Windows* alternative.

GORDON STUDER

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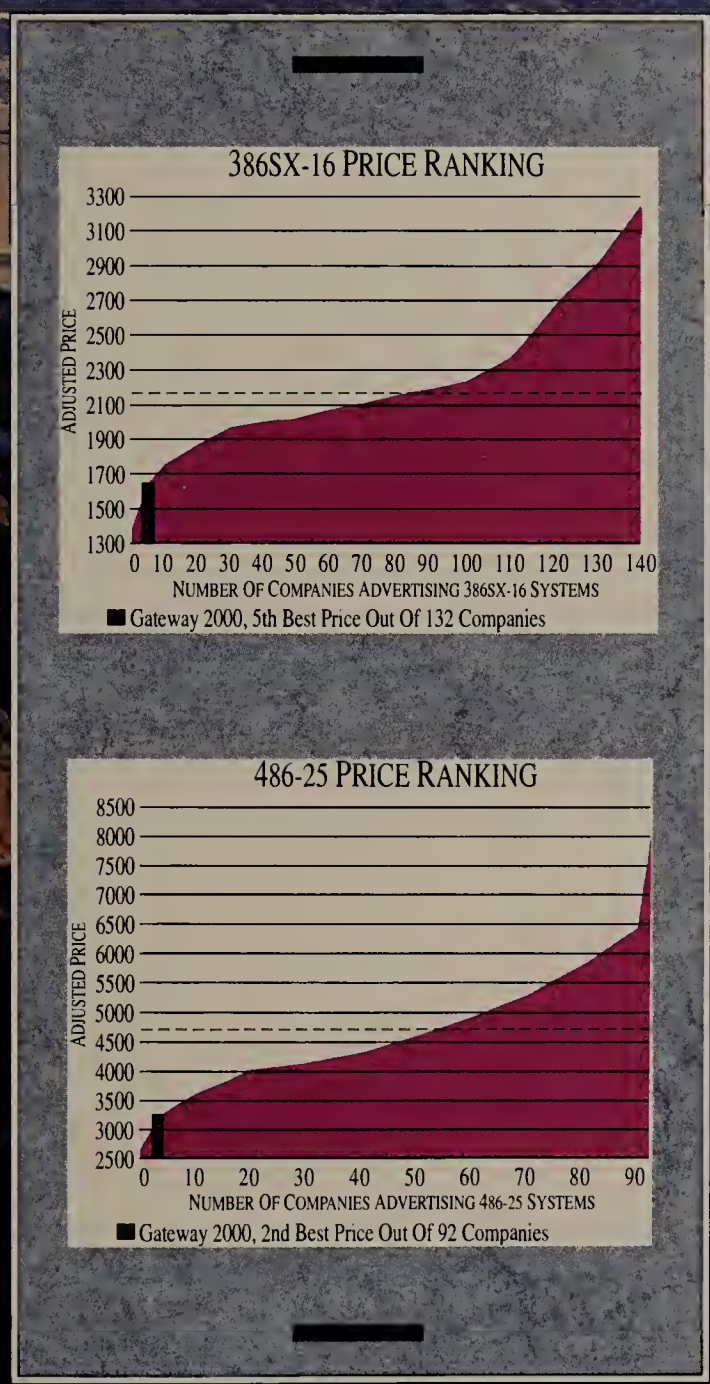

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*"We asked an independent research firm to do a study for us," said Ted Waitt, Gateway 2000 President. "I wanted to see an unbiased, direct comparison of features and prices from the manufacturers who advertise in the Computer Shopper. The results were astonishing," he exclaimed, "even to me. Ranked by best price, Gateway 2000 was the only major direct marketer at the top of the lists. The other 'big guys' in the direct market field were so far down in the rankings I couldn't even find some of them. Get a copy of the study and see for yourself."**

Ted Waitt, Gateway 2000 President

Computer buyers who purchased Gateway 2000 systems in January saved an average of $697 per system. This figure comes from a comparison of 132 computer manufacturers' advertised prices in the January 1991 issue of Computer Shopper. That means Gateway customers shared a total savings of $10,747,179 on 15,427 systems in one month alone.

No matter where you look, that's the best value you're going to find in this industry.

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"Whenever I'm asked," continued Ted, "why Gateway 2000 is so successful, my answer is: *value*. When you buy a Gateway 2000 computer, you're getting the best price, best quality and features, best service, all from a very strong, healthy company. That's value. Then I'm asked how we provide value," Ted remarked, "and the answer is almost the same. It's *values*. The values of the people at Gateway 2000 give our product its value," said Ted. "People who grow up in the Midwest value frugality, quality, resourcefulness, hard work, strength, and most of all, integrity and honesty in all dealings with other people. Providing value in our products starts with these values."

We Value Quality

Only the highest quality components go into a Gateway 2000 computer. Midwestern pride in workmanship and quality is demonstrated by every one of nearly 100 skilled assembly technicians. These technicians build your complete system one at a time.

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A company's strength is measured by its balance sheet. As independent sources will confirm, Gateway 2000 has an enviable balance sheet coupled with strong growth. Inc. Magazine listed Gateway as the second fastest-growing private company in America during 1990. Financial strength is crucial to you. What good are warranties, guarantees or promises of lifetime technical support if the company that sold you the computer goes out of business?

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Integrity is the fundamental value without which any organization is doomed. At Gateway 2000, you'll find integrity throughout the company, most visibly in sales and customer support. Gateway salespeople honestly represent the company and its products. Each person you deal with in customer support, during and after the sale, has a personal commitment to make sure you're completely satisfied.

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Gateway customer Robert C. True, Jr., writes: "We on the East Coast have become so accustomed to surly, uninformed and disinterested...staff, that working with your group may have induced an element of 'Culture Shock.' Every person in your organization operates as if there is only one customer in the world – the one they are talking to at the moment."

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- MS DOS 3.3 or 4.01
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Same configuration as the 25 MHz 486.

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Multimedia: What's It Good For?

That's a question a lot of software developers are asking themselves these days. The answer may surprise you.

Is the best PC program a general-purpose tool that users can adapt to their own needs, or is it a targeted business solution that gets a specific job done right?

If you've ever debated this point with a friend, you already know the answer. While specialized solutions like custom accounting or order entry can give you the information you need to keep your business humming, it's general-purpose tools like word processors and spreadsheets that turn people into PC loyalists.

Trouble is, general-purpose tools take too much effort to learn and provide too little help in cracking specific business problems. As a result, many people never really master the tools, while others never pick them up at all.

Software industry guru David Liddle terms this problem the "software sandbar": too few users stranded with the same old programs. Liddle, who heads IBM's new Patriot Partners software project, jokes that while users struggle to master the PC's "Big Four" categories—word processors and spreadsheets, spreadsheets and word processors—they're missing out on applications that could unleash their business creativity.

What we need is a new kind of PC software that combines the business knowledge contained in most custom applications with the power of general-purpose tools. Liddle and others in the software development community are banking on a host of new technologies to help forge this link between business knowledge and PC power, making it possible at last for users to push off the software sandbar under their own steam. Prominent among these new technologies is multimedia, which brings sound, animation, and vast volumes of information to your PC (see "Multimedia Gets Down to Business").

The software sandbar: too few users stranded with the same old programs.

Multimedia: Off the Software Sandbar

Most software in the first wave of multimedia falls into one or the other of two broad categories: huge reference data bases of information geared to specific professions, and training materials. While multimedia might end up spawning its own "Big Four" applications—reference and training, training and reference—developers are hard at work figuring out innovative ways to harness its special capabilities.

You won't find many real-life examples of breakthrough multimedia business programs today, but entertainment programs like *SimEarth* from Maxis demonstrate what's possible. *SimEarth* lets you build your own planet, using information stored in its earth-science data base plus a *Windows*-like interface with a rotating globe and sound effects that show you the impact of your choices. Imagine if the program were instead called *SimBudget*, and it led you through the process of building a five-year plan!

Wanted: Multimedia for Everybody

If multimedia is going to turn everyone's PC into the ultimate smart machine, then some things are going to have to change pretty quick. First, everyday software will have to develop multimedia talents. Imagine how nice it would be if voice messages or moving images were a natural part of any computer document, whether produced with a word processor, a spreadsheet, or a business graphics package. *Windows* programs will pick up this capability for free when a multimedia version of that environment appears later this year.

More important, developers are going to have to start building software with multimedia in mind. If your spreadsheet had the knowledge to help you build bulletproof budgets, then you'd probably turn everyone in your office

(continues)

FRED SIMSON

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into a budgeteer. Likewise, if your E-mail package could handle your voice mail, too, then you'd probably spend less time transcribing messages and more time acting on them.

Multimedia's no silver bullet for all that ails PC software. But it can shift the balance of computing power toward the center of the PC universe, away from the opposite poles of canned, inflexible solutions and broad, unwieldy tools.

PCs Into Plowshares

Now for the bad news: As you may have guessed, tomorrow's multimedia software is not likely to run on yesterday's XTs or ATs. Nor does it really make sense to push those obsolete computers down the organizational chart, onto the desks of secretaries and clerical workers who should also have access to multimedia. To take advantage of this new technology, they're going to need at least VGA-equipped 386SX PCs.

If you wonder what to do with all the underpowered iron that'll be lying around your office, International Data Group, *PC World*'s parent company, has an answer for you. Recently IDG established the East-West Education Development Foundation to place old PCs in the hands of students in Eastern Bloc countries. Your company gets a tax break for donating the equipment, you get to buy new PCs that can run the latest software, and Eastern European students get to experience firsthand the power of personal computing.

They say a PC plus a printer equals a personal printing press. Why not help give a voice to democracy in Eastern Europe? For more information, contact the East-West Education Development Foundation, IDG, One Exeter Plaza, 15th fl., Boston, MA 02116; 617/542-1234.

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St. #600, San Francisco, CA 94107; fax 415/442-1891; MCI Mail Richard Landry/301-3685.

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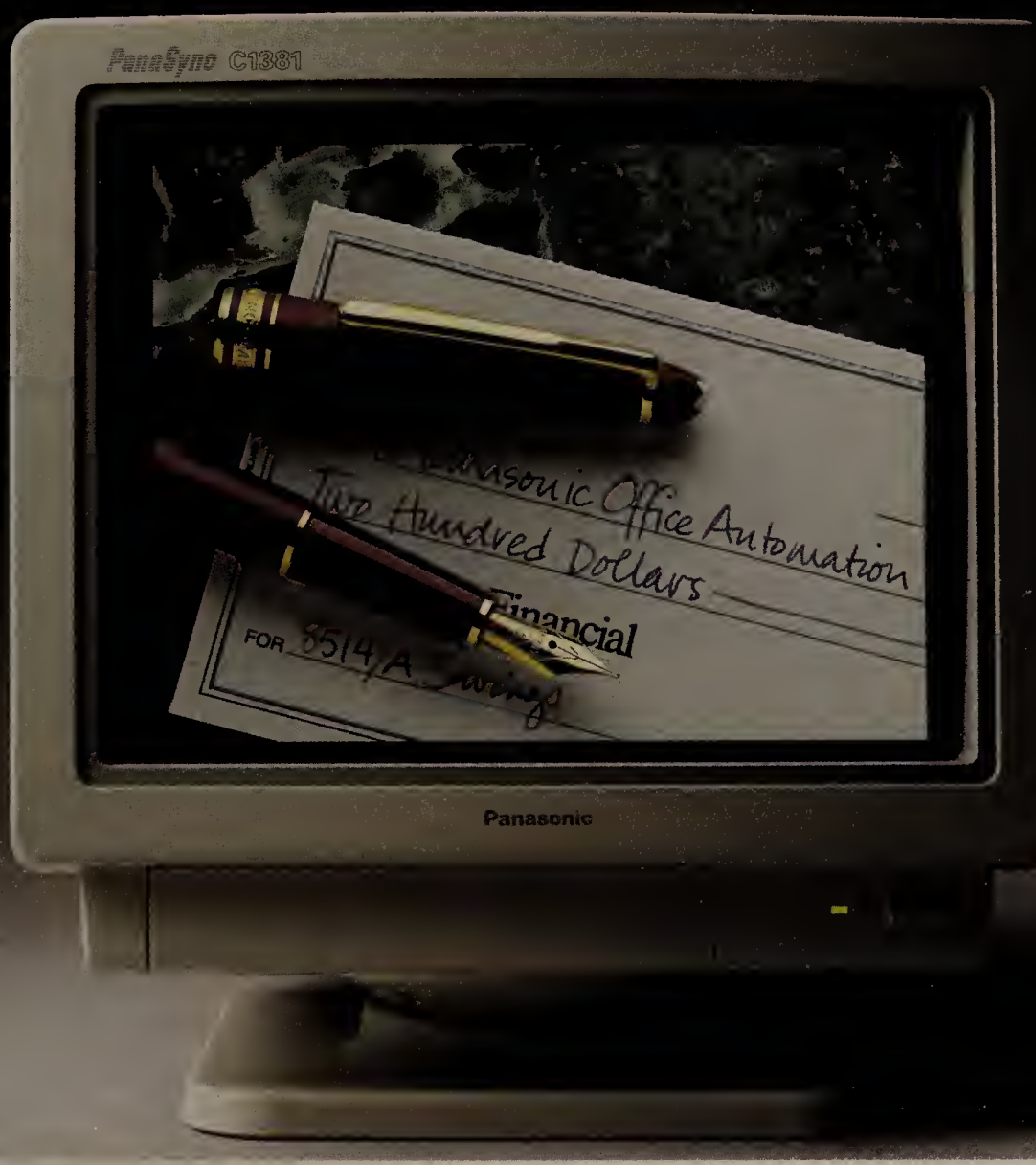

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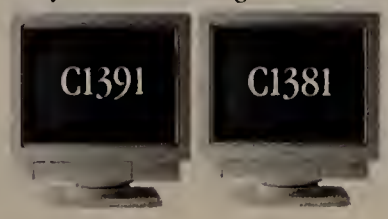

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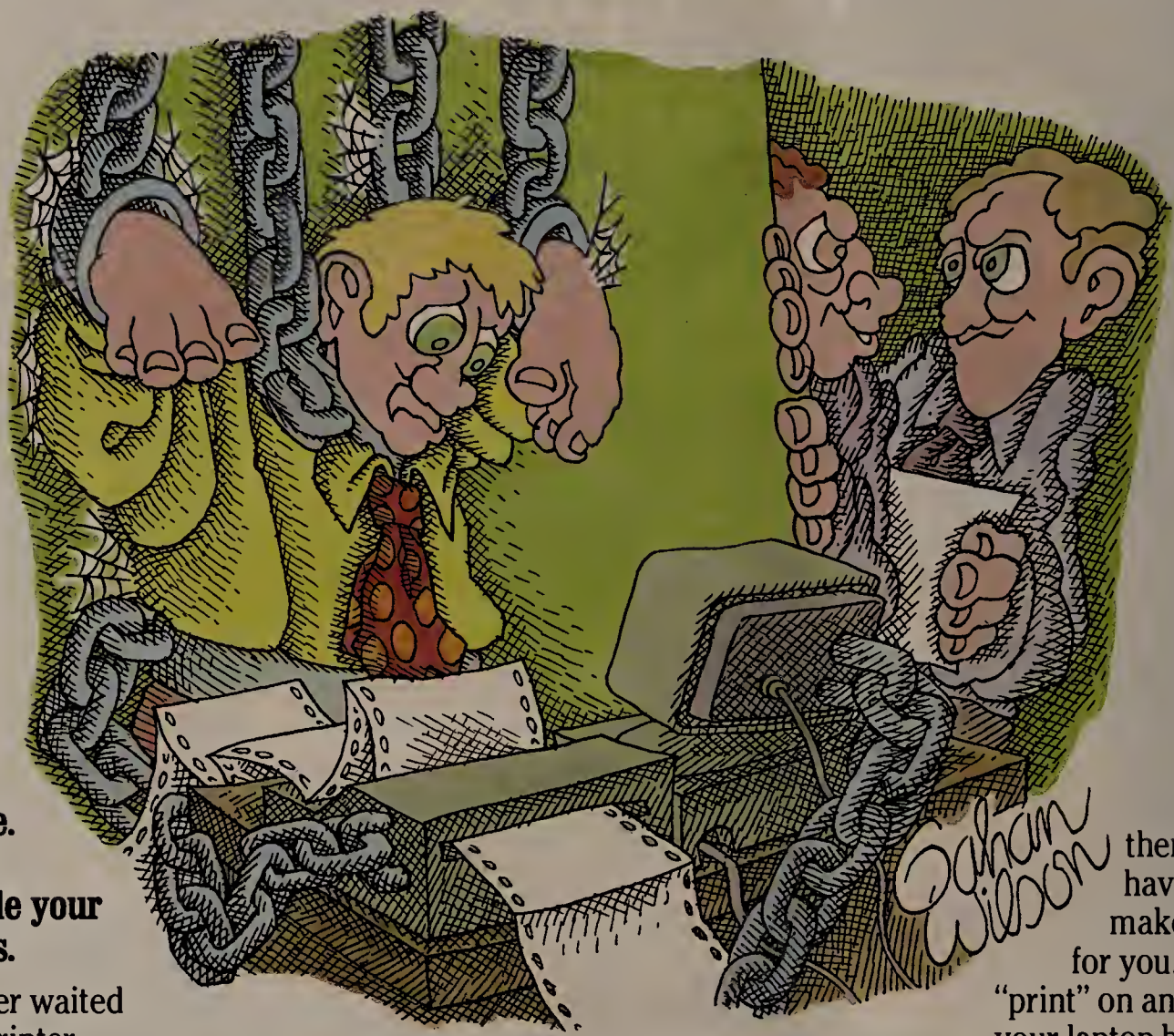
M3-PCD

Circle 214 on reader service card

Still hanging around, waiting for your spreadsheets to print?



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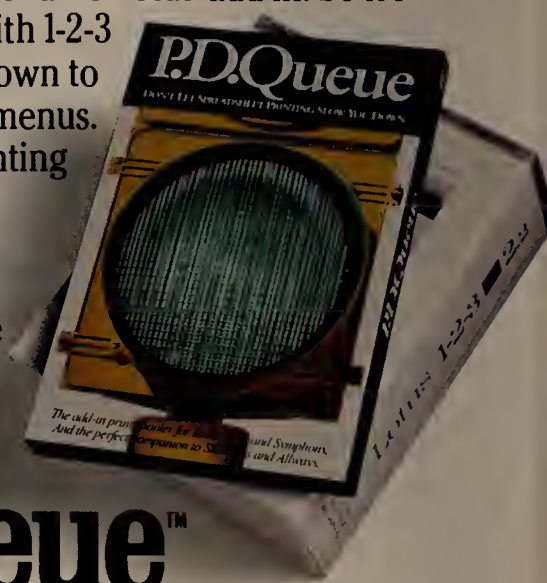

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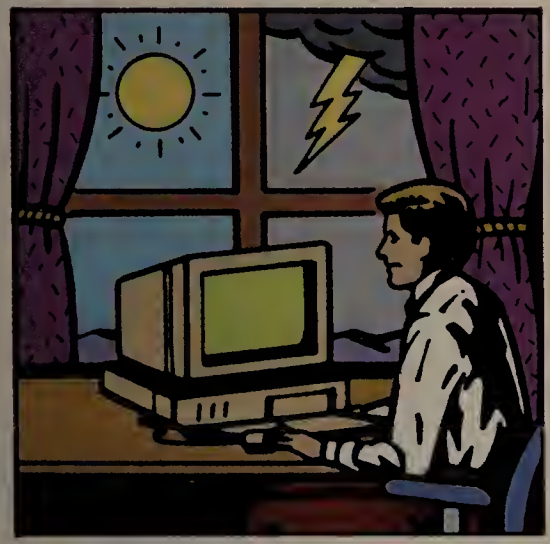
LETTERS

Reactions and responses from the PC World community



BRAD HAMANN

Views on Windows

Don't listen to the people who are sick of hearing about *Windows* ["Windows: A Reality Check," *Richard Landry,* February 1991]. Just wait until they get it and start nagging you for more articles on *Windows* applications. One of the reasons I recently purchased *Windows 3.0* was your information on the environment and its software. *Windows* is great; I don't know how I got by without its features. I believe that someday it will come with most PCs.

Darrin E. Rodriguez
New York, New York

ANTHONY RUSSO

In response to "Windows: A Reality Check," I say, *Windows, Windows, Windows?* More! More! More!

John J. Irvine
Fairfax Station, Virginia

Windows is certainly a marketing triumph. But I can find only two positives: the valuable abilities to integrate applications and to perform multitasking. Truly serious users of graphics applications need the Mac or OS/2—DOS is simply not up to the job. The *Windows* icons are laughably crude compared to the Mac's. My guess is that most people buy *Windows* for its promise to turn their PC into a Mac. It won't.

Carleton Sarver
New York, New York

Your faith in *Windows* is misplaced. Microsoft may have sold over a million copies, but how many are in use? So far, I find *Quattro Pro* to be better than any *Windows* program, and it doesn't eat memory like a ravenous hog. How often do you really need multitasking? Probably not as often as the pundits and Microsoft would have you believe.

Kevin E. Pyle
Millersburg, Ohio

No Forms Required

Regarding "Do-It-Yourself Taxes" in January: Don't be too concerned that no tax preparation package has versions for all 50 states. Instead, be concerned for the fine folks of Texas and Florida if ever such a package appears, since they currently have no state income taxes.

Howard L. Huntley, Jr.
Charlottesville, Virginia

A Two-Fisted Letter

One part of *PC World* that I find difficult to appreciate is Mark Marek's *Two-Fisted Management.* The physical, mental, and emotional brutality portrayed in this feature is just one more variety of violence. I believe society would benefit if this sort of vicarious savagery were removed.

Rev. Peter E. Loewy
Agaña, Guam

In Search of Free Space

It's time for software companies to recognize the ever-increasing requirements for disk space. I've yet to see a program that offers a list of files and a description indicating which are required. Those not used for running the program could be eliminated if not needed. With the advent of operating environments like *Windows,* it's ever more important to maximize disk space. I hope your publication can help wake up the industry.

W. A. Seedorf
Sunnyvale, California

One Dispute in 101

I like many of your tips in January ["101 Secret Tips"] but take exception to Number 13, "Turn Off Num Lock." Why disable the numeric keypad every time your AT or 386 boots up? Putting cursor keys on the numeric keypad on a 101-key keyboard is simply a concession to folks who learned computing with the 84-key job. At that time, Num Lock stayed off because there were no other cursor keys; today, it makes more sense to leave it on. Use the numeric keypad for what it was intended to do and the directional keys on the cursor keypad for moving the cursor.

Neil Edward Parks
Beachwood, Ohio

(continues)

Value Judgment

I read with considerable amusement "Value Alert! 20-MHz 386SX Systems" in February. Although I personally don't consider an SX a bargain at any price, I'd be interested in the logic that leads to the conclusion that 20-MHz SXs for $3500 to $4300 are a great buy when some vendors offer similarly configured 33-MHz 386s priced at around $3200.

James G. Craig, Jr.
Lynchburg, Virginia

I came to you as a converted *PC Resource* subscriber. I'm currently in the process of buying a 25-MHz or 33-MHz 386 for personal use. I'm using your general review configurations and looking at far less costly machines than the ones you review. There are probably way too many of these cheaper systems for you to check out, but could you give us an idea of what to look for (and steer away from)? You'd be providing information for the low-end as well as the high-end users.

Terry K. Stewart
Irving, Texas

We consider the 20-MHz SXs we reviewed good values from well-established companies. You can save a considerable amount by buying systems from little-known vendors, but many people think twice before committing their dollars to products from any but big-name companies. Aside from price, you need to consider service, support, and the track record and financial health of the vendor. For more details on buying a bargain system, see "Can You Afford a No-Name Clone?" in the August 1990 issue and the March 1991 Consumer Watch. *—Ed.*

Security If You Can Find It

Congratulations on a fine magazine, and thanks for shedding light on hardware security. I enjoyed Steve Bass's *Taking It Home* in January. I am interested in purchasing the Kablit theft-protection device to protect the investment I have in my computer equipment. But from Canada I can't call the 800 number you listed. So how can I get in touch with Secure-It?

Steven K. Won
Duncan, British Columbia, Canada

You can reach Secure-It at 413/525-7039. For information on products featured in any PC World *article, circle the appropriate reader service numbers on the product information card included in every issue and send it in. You can also use the card to request additional information from any of our advertisers. —Ed.*

(continues)

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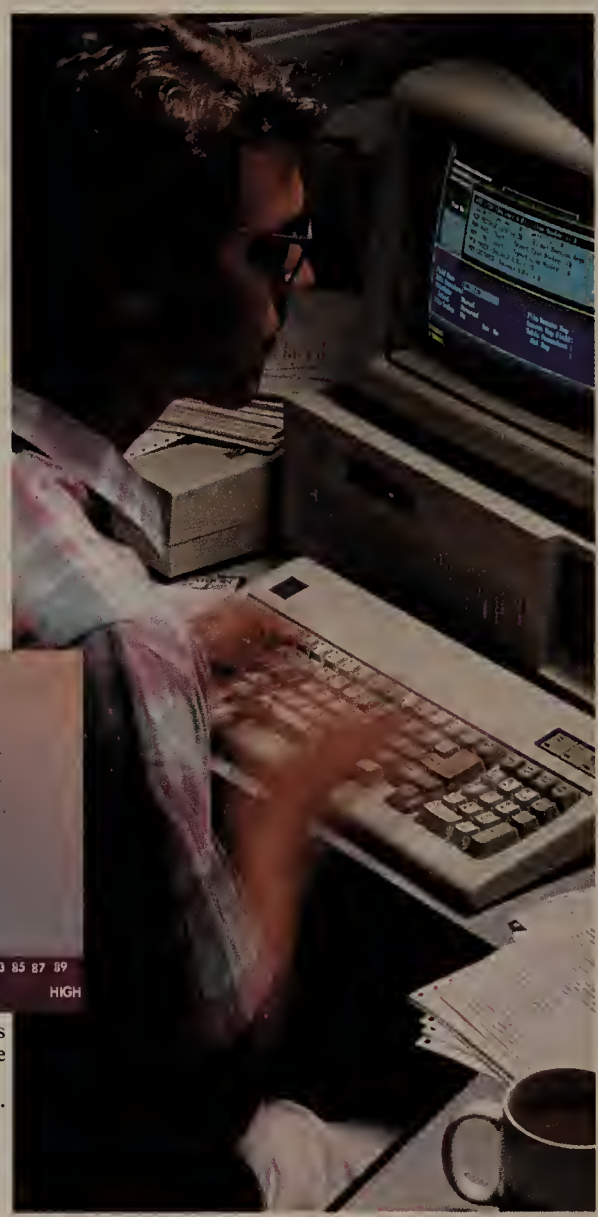

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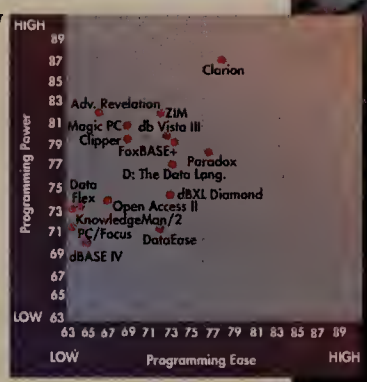

Here's what American corporations in a PC Week survey thought of the power and ease of use of Professional Developer vs. competitors.

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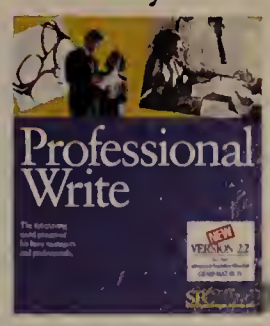

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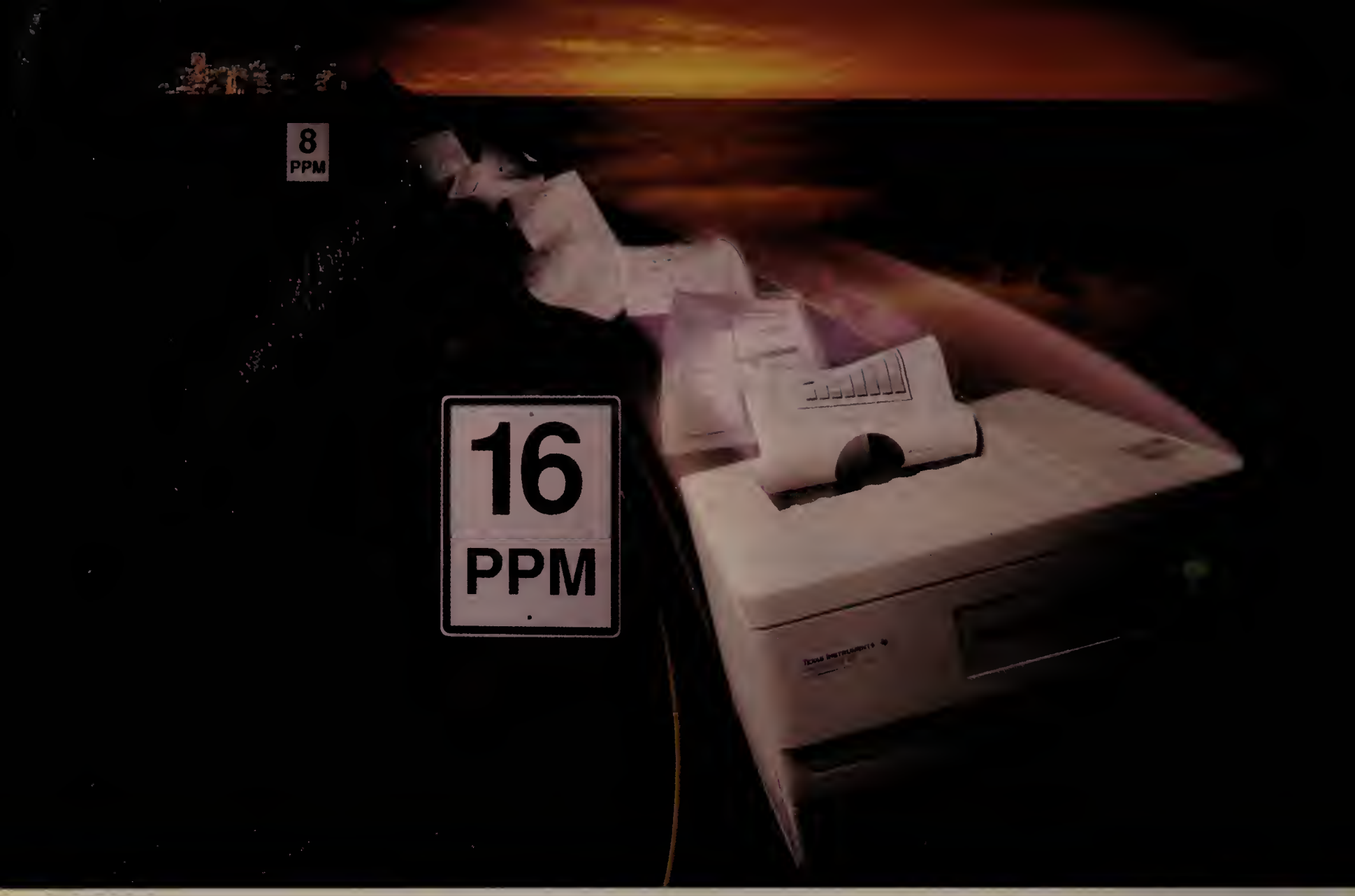

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Circle 263 on reader service card

Font Reaction

After reading your January review "Easy Fonts for Great-Looking Documents," I purchased Atech's *Publisher's Powerpak* for evaluation. When used with *Word 5.0*, the program doesn't support box shading and line drawing. This greatly reduces the value of the package for producing fliers or newsletters, and I don't use 30-point typefaces in my general correspondence.

Larry Middaugh
Bellingham, Washington

Mr. Middaugh is correct: Powerpak *won't work with* Word's *box and line drawing functions, which can be a problem if you produce fliers and newsletters with* Word. *Still,* Powerpak *is the only program that produces on-the-fly printer fonts for* Word, *and given its low price, we still consider it a Best Buy. —George Campbell*

Corrections and Clarifications

Our January fonts review ("Easy Fonts for Great-Looking Documents") states that ZSoft's *SoftType* has slower print speeds than *Adobe Type Manager* and can't accept third-party font outlines. Subsequent testing showed that *SoftType* was significantly faster than *ATM* in printing long documents and can in fact accept a variety of fonts from other vendors. *PC World* regrets the errors.

Products like *SoftType* are designed for different purposes than on-the-fly font scalers like *ATM*. With *SoftType* you can design your own typefaces and export font outlines for use with *ATM*. The trade-off is that you must create fonts ahead of time and store them on disk—consuming a considerable amount of time and disk space. For example, creating one typeface in four styles and seven sizes required 15 minutes and 1.5MB. If you later decide you need additional fonts, you must switch from your current *Windows* application to *SoftType*, create the fonts, then switch back to your application to use them. Most users will find it simpler to use an on-the-fly program, but *SoftType* offers impressive tools for power users who need a variety of fonts and want to customize their own.

Our February *Product Outlook* item on Microrim's *Personal R:base* contained a misleading statement about its application compatibility. Applications generated by both *Personal R:base* and *Professional R:base 3.1* are fully cross-compatible, but programs and data files generated by prior versions of *R:base* are not compatible with either program. *PC World* regrets any misunderstanding. Call Microrim at 206/649-9500 for information on conversion programs.

The Fax Group has moved since our March Buyers' Guide "Fax Boards and

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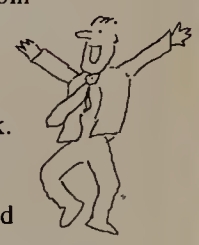

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Since we published the December letter from Roland Cole, president of the Association of Personal Computer User Groups, APCUG has changed some of its contact procedures. The BBS number 408/439-9367 (settings N-8-1) is now for 2400-bps MNP-5 or 9600-bps modems only. Use 408/439-9371 (N-8-1) for other modems. APCUG is a volunteer, not-for-profit information network for over 165 U.S. and international user groups. You can sign up your group by downloading a registration form; writing to APCUG, 1101 Connecticut Ave. NW #901, Washington, DC 20036; or calling 704/425-9896.

Send your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your name, the name of your city and state, and your phone number. We reserve the right to edit letters.*

POWER TIP NO. 176

Swap Mouse Buttons

By default, *PC Tools Deluxe*'s shell program doesn't care which mouse button you use to open menus or select a file. But if you want to copy, delete, or otherwise manipulate a group of files, you must use the left mouse button. If you're left-handed, however, this can be a pain. The solution: Swap the mouse button functions by using **pcshell /le** at the DOS prompt to load the shell.

Lincoln Spector
Assistant Editor

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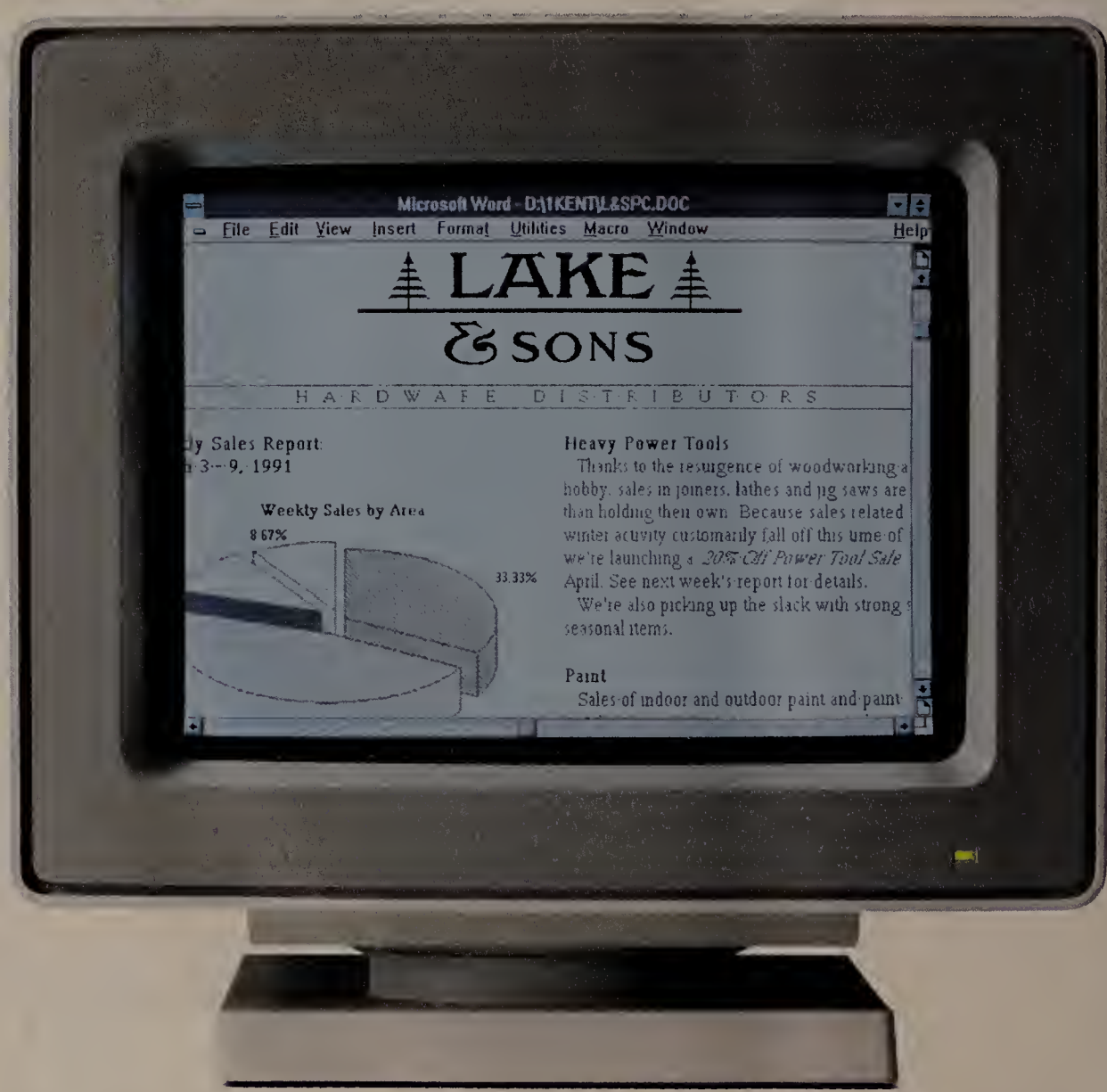

(This impression courtesy of Microsoft Excel and Word for Windows.)

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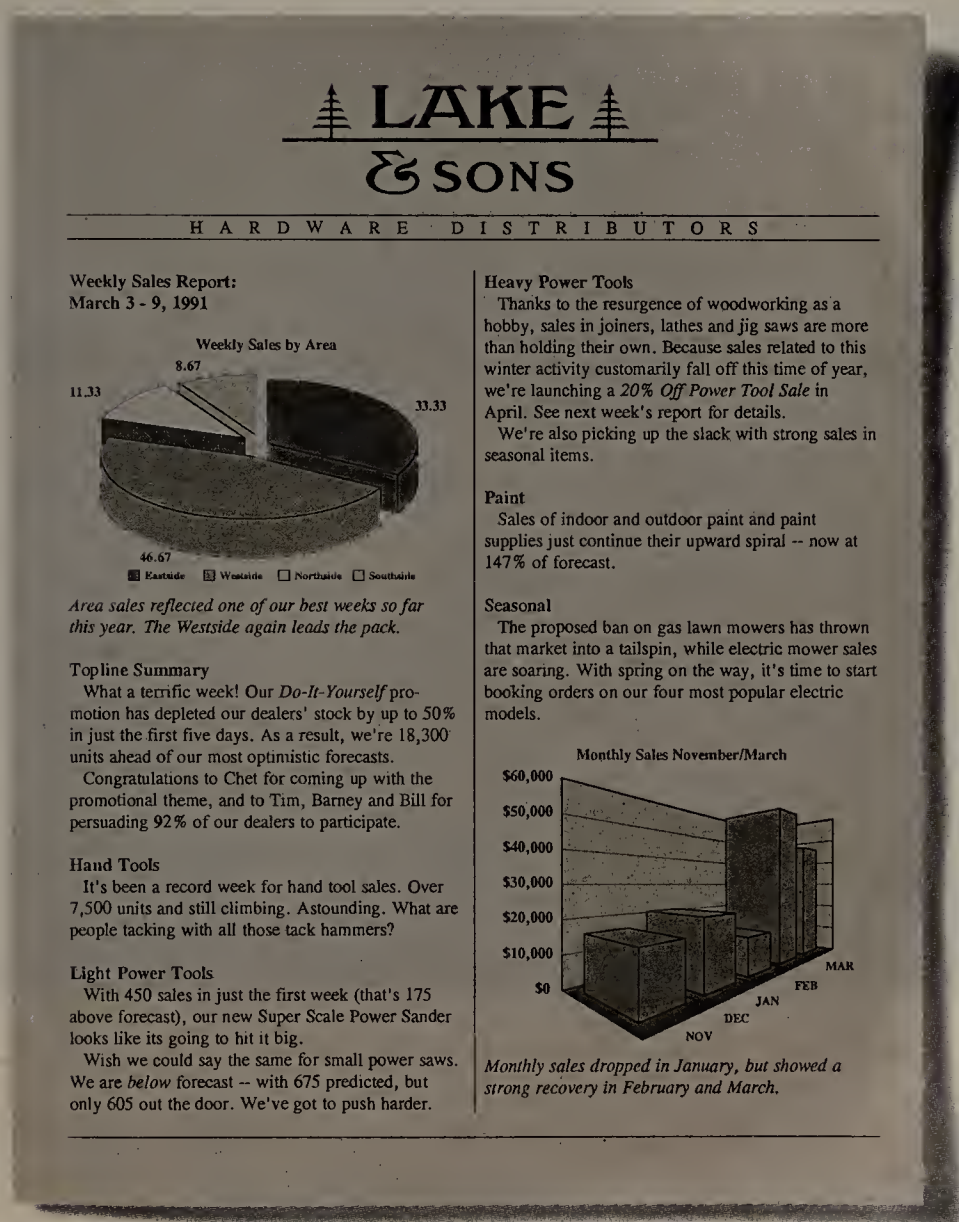

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Weekly Sales Report:
March 3 - 9, 1991

Area sales reflected one of our best weeks so far this year. The Westside again leads the pack.

Topline Summary

What a terrific week! Our *Do-It-Yourself* promotion has depleted our dealers' stock by up to 50% in just the first five days. As a result, we're 18,300 units ahead of our most optimistic forecasts.

Congratulations to Chet for coming up with the promotional theme, and to Tim, Barney and Bill for persuading 92% of our dealers to participate.

Hand Tools

It's been a record week for hand tool sales. Over 7,500 units and still climbing. Astounding. What are people tacking with all those tack hammers?

Light Power Tools

With 450 sales in just the first week (that's 175 above forecast), our new Super Scale Power Sander looks like its going to hit it big.

Wish we could say the same for small power saws. We are *below* forecast -- with 675 predicted, but only 605 out the door. We've got to push harder.

Heavy Power Tools

Thanks to the resurgence of woodworking as a hobby, sales in joiners, lathes and jig saws are more than holding their own. Because sales related to this winter activity customarily fall off this time of year, we're launching a *20% Off Power Tool Sale* in April. See next week's report for details.

We're also picking up the slack with strong sales in seasonal items.

Paint

Sales of indoor and outdoor paint and paint supplies just continue their upward spiral -- now at 147% of forecast.

Seasonal

The proposed ban on gas lawn mowers has thrown that market into a tailspin, while electric mower sales are soaring. With spring on the way, it's time to start booking orders on our four most popular electric models.

Monthly sales dropped in January, but showed a strong recovery in February and March.

(This impression courtesy of the Hewlett-Packard LaserJet III printer.)

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Compared to a menu program like this, everything else is for the birds.

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THE HELP SCREEN

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Run Windows on 386SX systems, take a laptop overseas, modify a blinking cursor, install print spoolers for both your printers, find out how much video display memory you have, derive the last day of the month with 1-2-3 and Quattro, and easily copy high-density disks with a single drive.

Karl Koessel and Robert Lauriston

ANTHONY RUSSO

SX Versus DX for Windows

Q. *A salesperson told me that a 386SX will run* Windows 3.0 *but that you need a 386DX [the full-powered 80386] to transfer data between programs. He said this is because data transfer requires the DX's 32-bit external data bus, and the SX has only a 16-bit bus. Is this true?*

Donny Kennedy
Wauwatosa, Wisconsin

A. You'd better look for a less imaginative salesperson. *Windows* runs just fine on systems based on either processor. Internally, both 386 CPU chips are the same, and any software that runs on one will run on the other. In fact, an SX and a DX running at the same speed (16 MHz or 20 MHz) perform all their internal functions at the same speed.

The only scrap of truth in his spiel is that the 386DX's external data path is 32 bits wide, while the 386SX's is only 16. That means a DX-based computer (that is, one with a 32-bit memory bus) can transfer data to and from memory—and sometimes to and from the hard disk and other peripherals—twice as fast as would an identically configured SX system. When you, or Dynamic Data Exchange (DDE) links, move or copy data between programs in *Windows*, it's transferred from one place in memory to another. For that reason, data transfer between programs is slower on an SX-based system, but it's not impossible.

Because both processing and data transfer speeds affect a computer's performance, DX-based systems are faster than SX-based systems of the same clock rate. Also, manufacturers often use slightly slower hard disks in SX systems, which contributes to the DX-based system's performance edge.

Transferring data 32 bits at a time to and from 32-bit *peripherals*—such as those you might use in a 32-bit EISA or Micro Channel architecture expansion bus—does require a 386DX (and/or the rarely incorporated 32-bit DMA chips), but such transfers are not of much significance for a single-user system (though they might be for a network server).

International Laptop

Q. *I'm taking my laptop with me on a European trip and want to recharge it using 220-volt outlets. I own one kit that converts European current for hair dryers and another that I've used for camera equipment. Would either of these be suitable?*

Albert Winson
Vista, California

A. Probably not. The small solid-state converters designed for blow dryers and other small appliances don't step 220-volt power down to the 110 volts your laptop needs. Instead, they cut off the first and third quarter of the alternating current's sine wave. The resulting *current* is halved—but the peak voltage isn't reduced. The high peak voltage doesn't bother a travel iron's heating element or an electric shaver's motor, but it will zap a laptop's (or any solid-state device's) sensitive circuits.

The only laptops that can safely use solid-state converters are those that, instead of plugging directly into the wall, use removable batteries and an external charger. The batteries and charger won't be bothered by the higher peak voltage.

Other laptops require a stepdown transformer, which consists of two intermingled coils of wire, making it larger, heavier, and more expensive than its solid-state cousin. If your laptop has an external power supply, there may be another alternative: Most major laptop manufacturers offer 220-volt or dual-voltage power supplies.

Stop That Blinking Cursor

Q. *Do you know of any utilities or a DEBUG procedure that stops the cursor from blinking?*

Christopher Kocks
Niles, Michigan

(continues)

A. There are numerous utilities that change the size and shape of the cursor (including CURSOR.COM, which comes with *WordPerfect*, and the *Norton Utilities'* Control Center). But there's no way to stop the cursor from blinking; that's set in hardware. Video board manufacturers can't change their hardware to permit a nonblinking cursor, as it would limit their boards' compatibility with the IBM PC standard.

Multiple Print Caches

Q. *I've got two printers attached to my computer: for bills, a daisy wheel attached to the serial port, and for accounts receivable reports, a dot matrix attached to the parallel port. I have a print-spooler utility, but when I try to print to both printers simultaneously, jobs go to the wrong printer or switch back and forth unpredictably. Can you help me?*

Bernard D. Sommers
Maitland, Florida

A. We haven't seen any single-user print spoolers that can handle two print queues. Most won't even let you load the program a second time with different settings. Two that do are *PrintCache* (formerly *LaserTorq*) from LaserTools and *PC-Kwik Power Pak* from Multisoft. Both companies' telephone support personnel are experienced at helping users set up exactly the kind of configuration you describe.

WHERE TO BUY

PrintCache
LaserTools Corp.
1250 45th St. #100
Emeryville, CA 94608
800/767-8004, 415/420-1150 (fax)
LIST PRICE: $149
Reader service no. 610

PC-Kwik Power Pak
Multisoft Corp.
15100 S.W. Koll Pkwy.
Beaverton, OR 97006
800/759-5945, 503/646-8267 (fax)
LIST PRICE: $129.95
Reader service no. 611

Display Memory Readout

Q. *I recently purchased a 386 clone with a super-VGA video board. My invoice shows 512K of video RAM, but* Norton Utilities 5.0's *System Information utility reports only 256K installed. The salesperson who sold me the system says that DOS can recognize only 256K. Is this true?*

Carl Gussgard
Fremont, California

A. Actually, DOS can't tell display memory from normal memory; it depends on a routine in the system's BIOS to report the amount of display memory. The 256K limit comes from IBM's EGA board, on which IBM's VGA and its clones are all based. Because the EGA board holds a maximum of 256K of display memory, there's no standard way for a program to find out whether your VGA board has more than 256K RAM. Symantec, publisher of *The Norton*

(continues)

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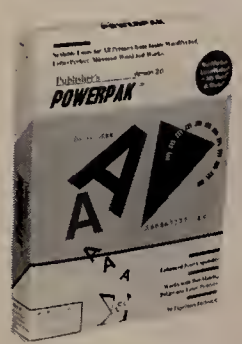

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Utilities, tells us that the next version of System Information will be able to indicate accurately the amount of display memory for many popular boards. If it can't report a board's exact video RAM count, it will report "at least 256K."

The Last Word on the Last Day

A few readers have figured out formulas for *1-2-3* and *Quattro* that derive the last day of the month for any given serial date (see "The Last Day of the Month" in the February 1991 *Help Screen*). Our thanks to Thomas M. Zopff of Lebanon, Ohio, and Jeffrey W. Page of Wyomissing, Pennsylvania, for the ever-so-simple **@if(@month(a2) = 12, @date(@year(a2), 12, 31), @date(@year(a2), @month(a2)+1, 1)-1)**, and to James P. Harlos of Amherst, New York, for **@date(@year(a2+32-@day(a2)), @month(a2+32 - @day(a2)),1)-1.**

Copying High-Density Disks

We've also been informed of two programs that enable users with a single high-density drive to copy floppy disks with a minimum of disk swapping (see "DISKCOPY in Extended Memory?" in February's column). Roger Schlobin of Chesterton, Indiana, recommends M. Blanco's *1Pass*, which uses expanded memory and can be found on CompuServe (GO NOVA). Richard Breitbarth of Kenilworth, New Jersey, favors a $15 shareware program called *CopyQM* from Sydex, P.O. Box 5700, Eugene, Oregon 97405; 503/683-6033, 503/683-1622 (fax). Our thanks to both of them for taking the time to help fellow readers.

How does...? What can...? Should I...? Send your PC questions to The Help Screen, PC World, *501 Second St. #600, San Francisco, CA 94107-1431; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Questions with the broadest appeal will be published.*

Karl Koessel is the technical editor and Robert Lauriston a contributing editor for PC World.

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"highly recommended" by John Dvorak, Inside Track, PC Magazine, Nov. 13, 1990

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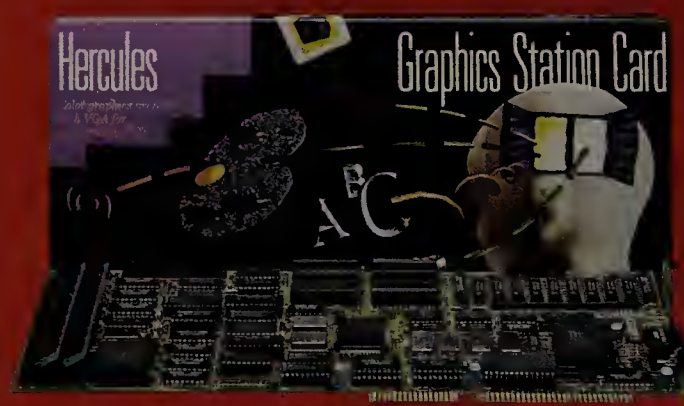
InfoWorld, Hercules' 34010 Graphics Board is State of the Art, Eric Azinger, Sept. 3, 1990

"...1024 x 768 non-interlaced 256 colour mode is the only way Windows should ever be run."
Personal Computer World, Guy Swarbrick, Hercules Graphics Station Card, June 1990, UK



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CADalyst, Ralph Grabowski, August 1990

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PC Magazine, Tom Unger, Best of 1990, January 15, 1991

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Personal Computer World, Guy Swarbrick, Hercules Graphics Station Card, June 1990, UK

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Circle 116 on reader service card

NETWORK Q&A

Advice for Local Area Network Administrators With Microsoft Windows Workstations

Keith Nickerson

Q. *What's the bottom line on using* Windows' *swap files on a network? I've been given conflicting advice. It seems that a permanent swap file can be set up on a local hard disk, but what about diskless workstations? And what's the difference between a permanent swap file and a temporary swap file?*

Gerard Malanga
New York, New York

A. *Windows'* swap files do indeed offer a bit of a challenge for LAN administrators. When you're running *Windows 3.0* in 386-enhanced mode and get low on memory, *Windows* can swap currently unused information from memory to a swap file on your hard disk, swapping it back to memory later, when it's needed. (You can run *Windows* in 386-enhanced mode only on 386 and 486 systems with at least 2MB of RAM.)

A permanent swap file remains on your local hard disk until removed (you cannot set up a permanent swap file on a RAM disk or a network drive). You create, change the size of, and remove a permanent swap file using *Windows'* Swapfile utility: Start *Windows* at the DOS prompt with **win/r** to force it into Real mode, select *File Run*, and enter **swapfile**; program help screens clearly explain the rest of the process. Because permanent swap files aren't fragmented, they're faster than temporary ones, but they take up disk space even when you're not running *Windows*.

If you don't have a permanent swap file, *Windows* automatically creates a temporary one in your \WINDOWS directory when you start the program in 386-enhanced mode. (It's deleted when you properly exit *Windows*.) That's fine if you're running *Windows* off a local hard disk, but if you're running a shared copy of *Windows* off a server, the swap file is created on the network drive; accessing it increases traffic over your network wire, diminishing overall network performance. To avoid this degradation, you must reconfigure *Windows* to force the swap file to the local hard disk. The easiest way is to add **PagingDrive=c:** on a line by itself under the [386Enh] section of SYSTEM.INI.

When running *Windows* on a workstation without a hard disk, you must disable the swap file entirely by adding **Paging=no** on a line by itself under the [386Enh] section of SYSTEM.INI. *Windows* will no longer be able to free up memory by swapping and will be limited to whatever physical memory exists on that machine. If the system doesn't have enough memory to run your *Windows* programs without swapping to disk, your only option is to add more memory or a hard disk.

Q. *Our network users run* Windows *at their workstations, and this setup is proving to be advantageous. They no longer have to deal with DOS to run their programs; they simply double-click the appropriate icon.*

My problem is that for administrative purposes, I need to move an application on our LAN to a different directory. How can I do this without having to modify (via Program Manager's File Properties command) the command line associated with that application's icon for every user?

Barbara McTeague
Des Moines, Iowa

A. The best way to avoid that tedious task is with a shared program group (GRP) file. A GRP file contains the command lines, along with other information, for the icons in a given Program Manager group. After moving the application in question to its new network directory, create a master program group containing that and any other shared application you want to include. Move the resulting GRP file to a subdirectory on your file server, flag it "Shareable Read-Only," and give only yourself Modify rights to the directory. Then edit the [Groups] section of the users' PROGMAN.INI files to reference the shared GRP file(s). **FIGURE 1** shows an example of how the result might look for a network with four shared groups.

```
Group1=F:\WINDOWS\GROUPS\WINDOWS.GRP
Group2=F:\WINDOWS\GROUPS\MAIN.GRP
Group3=F:\WINDOWS\GROUPS\ACCESSOR.GRP
Group4=F:\WINDOWS\GROUPS\GAMES.GRP
```

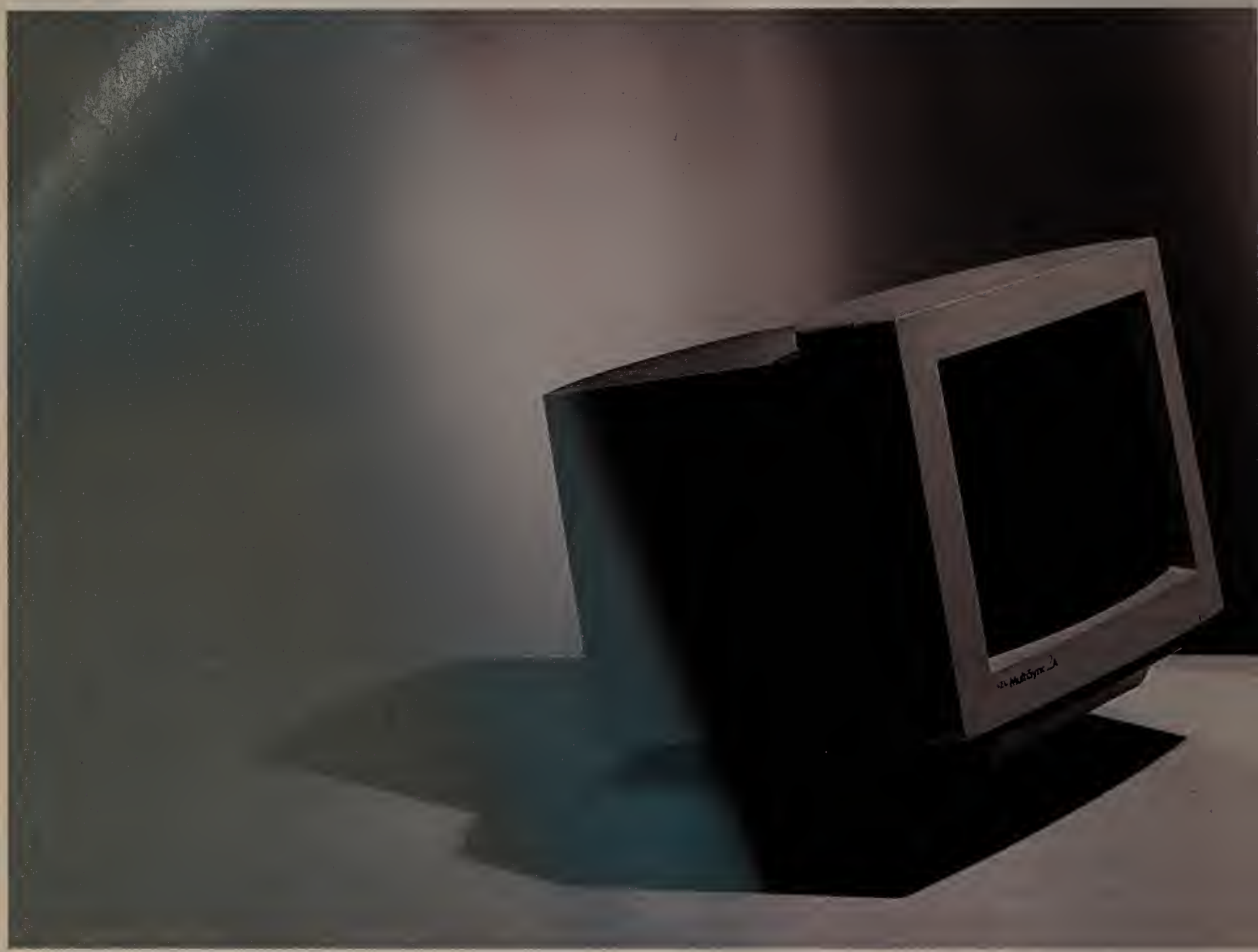
FIGURE 1: The [Groups] section of PROGMAN.INI tells Windows where to find GRP files, which specify the commands, icons, and other information about Program Manager groups. Network users can share GRP files if the files are kept on a server.

Note that workstations with different video modes may not be able to share Program Manager GRP files. If your network has some systems with EGA boards and others with VGA boards, for instance, you'll need to maintain two sets of GRP files.

Another inconvenience to the shared GRP files approach is that all users see the same icons in that program group. If you limit some users to certain applications, they may be confused by the appearance of icons for programs they can't run. You can get around this by creating GRP files for work groups or classes of employees and adding them only to the appropriate users' shared PROGMAN.INI files.

Keith Nickerson is editor of NetWare Advisor *and a member of the publishing team at Business Systems Group, a Houston-based systems integration firm.*

On the left, the best-selling VGA monitor. On



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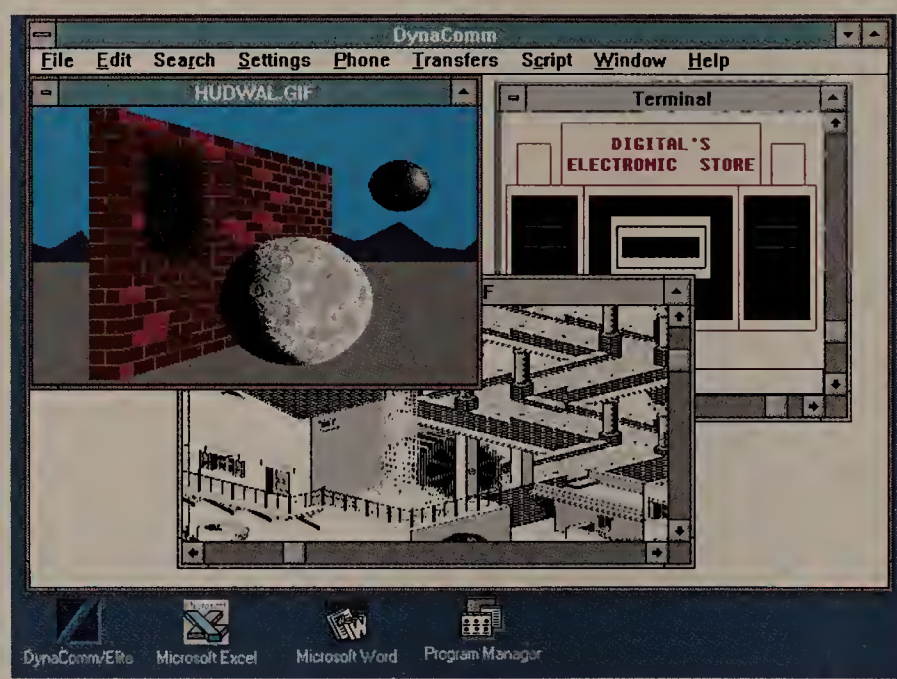

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PC WEEK LABS ANALYST'S CHOICE
DynaComm 3.0
January 28, 1991

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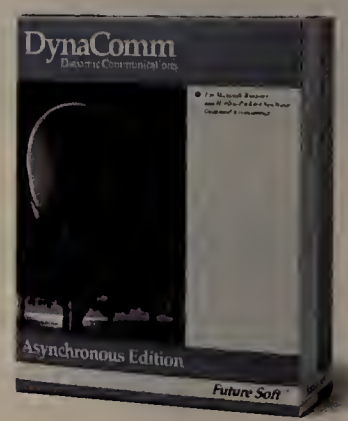

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CONSUMER WATCH

Advice and information for the computer consumer

Monitors and radiation: New units offer lower emissions, but research issue goes unaddressed

Roberta Furger

New Choices in Low-Emissions Color Monitors

Responding to users' growing concern about the potential health hazards associated with video display terminals (VDTs), several leading manufacturers have introduced low-emissions versions of their popular PC monitors.

When *Consumer Watch* last reported on low-frequency electromagnetic monitor emissions (December 1990), only one manufacturer offered a general-purpose low-emissions unit. Today consumers can choose from a variety of monitors that often cost only slightly more than unmodified units.

The new units support the initial reduced-emissions requirement established in Sweden, covering very-low-frequency (VLF) emissions. The Swedish standards were recently expanded in response to growing concern about the potential carcinogenic effects of extremely-low-frequency (ELF) emissions (see the figure "Toward Even Safer Monitors"). The current crop of low-emissions monitors do not meet these guidelines, but most makers say future units will comply.

But "the real issue has never been properly addressed," cautions Louis Slesin, editor and publisher of *VDT News*, referring to the lack of definitive research into whether VDTs' ELF emissions pose a serious health risk. He argues that the new low-emissions monitors may even serve to further delay a detailed review of the issue.

Despite the lack of information, many manufacturers believe it makes good business sense to provide low-emissions monitors. "It gives people a choice," says Pam Himmell, NEC product manager. In the future, Himmell predicts, low-emissions modifications will be "just another item on a features checklist."

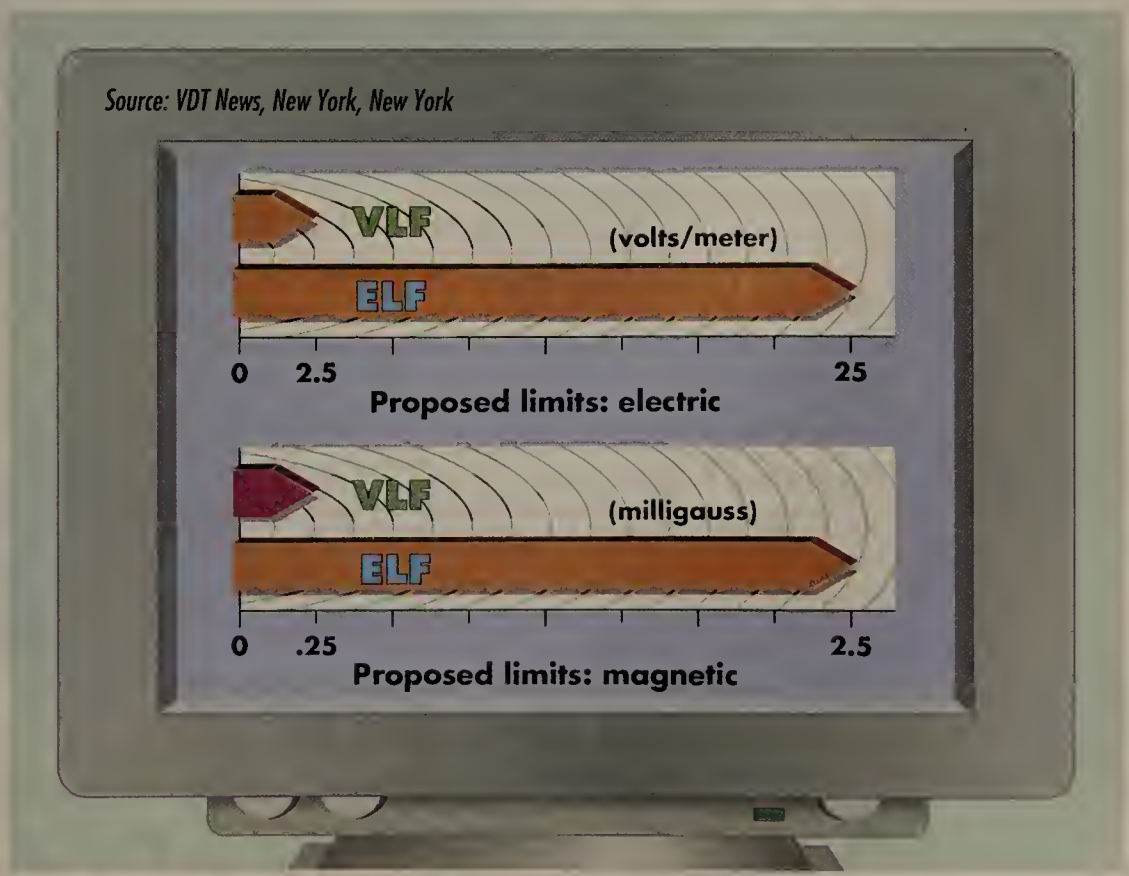
IBM was first to introduce a low-emissions color monitor in the United States: the 8515 Color Display. Since then a host of other manufacturers have followed suit, among them NEC, American Mitac, and Qume (see the table "Your Low-Emissions Choices").

A Good First Step

VDT News's Slesin argues that the new units represent a pragmatic approach to an as-yet-unresolved issue. He adds, however, that in the absence of definitive

(continues)

Toward Even Safer Monitors



The current crop of low-emissions monitors comply with the original safety guidelines for very-low-frequency (VLF) magnetic emissions established by the Swedish National Board for Measurement and Testing (MPR) in 1988 (red bar). This year MPR will release a new and more stringent set of guidelines that also covers extremely-low-frequency (ELF) emissions.

ANTHONY RUSSO

BUG WATCH

Up-to-date information about hardware and software bugs

AST Premium 486/33 CPU Card
Computers with one of these CPU boards classified as revision "B" or earlier lock up or operate improperly when trying to boot IBM OS/2 1.2, AST OS/2 1.2, or Novell NetWare 3.0 NET$OS.EXE from the A: drive. Replacement of a chip corrects the problem. Fixes are available through authorized dealers or from AST directly.
AST Research
800/727-1278

Corel Draw 2.0
Several problems have been identified with the WFNBOSS utility disk included with *Corel Draw 2.0*, most notably its inability to correctly convert fonts from Corel's font format to Adobe Type 1 format. The utility is being overhauled and will be mailed free of charge to all registered 2.0 users.
Corel Systems Corp.
613/728-8200

IBM PS/1
Because the PS/1 system starts from ROM, it fails to recognize changes that software applications make during installation to the CONFIG.SYS and AUTOEXEC.BAT files on your hard disk. To correct the problem, go to the DOS shell's 'Customize How System Starts' menu, and select the option that tells the system to read both files from disk rather than from ROM. If software still won't install correctly, choose the option that requires the system to boot from disk at all times, and reinstall that software. Then restart the system to boot from ROM. Additional information is available through the PS/1 Users' Club on Prodigy.

IBM PS/2 8513 Display
Models of the 8513 12-inch color monitor manufactured before 1988 have been found to gradually lose their ability to focus. The problem makes itself known over time; the more frequently the monitor is used, the sooner the defect will be encountered. (Some users may not have noticed the problem because their eyes adjust to the out-of-focus display.) Owners of 8513 units that cannot be made to focus properly can receive a new unit free of charge from IBM.
IBM
800/426-2468

Your Low-Emissions Choices

Manufacturer	Product	Monitor type	Price	Availability
American Mitac	L1420	14-inch VGA	$795	immediate
Cornerstone Technology	DualPage Display	19-inch monochrome	$2495	immediate
	DualPage Display	19-inch gray-scale	$2845	immediate
CTX Int'l	5468	14-inch VGA	$599	third quarter
	5468-NI	14-inch VGA noninterlaced	$669	third quarter
IBM	8515 Color Display	14-inch VGA	$950	immediate
NEC Technologies	MultiSync 3DS	14-inch multiscan	$1049	immediate
Qume	QM835VLF	14-inch VGA	$699	immediate
Sigma Designs	L-View	19-inch monochrome	$2195[1]	immediate
	L-View	19-inch gray-scale	$2495	immediate
	PageView	15-inch monochrome	$1299[2]	immediate
	SilverView	21-inch monochrome	$2195	immediate
	SilverView	21-inch gray-scale	$2995	immediate

[1] $2495 for PS/2 and compatibles version. [2] $1399 for PS/2 and compatibles version.

WHERE TO BUY

American Mitac
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287
Reader service no. 710

Cornerstone Technology
1990 Concourse Dr.
San Jose, CA 95131
408/435-8900,
408/435-8998 (fax)
Reader service no. 711

CTX Int'l, Inc.
20530 Earlgate St.
Walnut, CA 91789
714/595-6146
Reader service no. 712

IBM
1133 Westchester Ave.
White Plains, NY 10604
800/426-2468
Reader service no. 713

NEC Technologies Inc.
1255 Michael Dr.
Wood Dale, IL 60191
800/632-4636
Reader service no. 714

Qume Corp.
500 Yosemite Dr.
Milpitas, CA 95035
800/457-4447
Reader service no. 715

Sigma Designs, Inc.
46501 Landing Pkwy.
Fremont, CA 94538
415/770-0100
Reader service no. 716

For more information about all products in this table, circle reader service number 909.

Reduced-emissions monitors are now available from a number of leading monitor manufacturers; other companies indicate they will follow suit. All monitors listed limit VLF emissions only.

studies, the roughly 50 million current users of VDTs in the U.S. are still left hanging as to the real dangers posed by sitting in front of a display.

"The good news is that [we'll soon] have low-ELF terminals," Slesin says. "The bad news is that we still don't know the risk ELF poses."

SHOP TALK

Compatibility Problem Leads to Finger Pointing

Several months ago I purchased an Intel 287XL math coprocessor for my 20-MHz Dell System 220 computer. Intel claimed the chip would work in any 286-based computer up to and including 20-MHz systems. Prior to purchasing the chip, I called Dell technical support. They said they saw no reason why the chip would not work but added that they had not installed one in a System 220.

After I installed the chip, Intel and Dell diagnostics revealed that it would not perform long division correctly. Dell's technical support recommended I install Intel's 80287-10 math coprocessor instead. Intel, however, claims the

(continues)

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287XL is 50 percent faster than the 80287-10, and I want the extra speed. Intel's support was only slightly more helpful.

It seems as though my inquiries have yielded nothing more useful than a lot of finger pointing. Perhaps you can help.

Ned Solot
Los Angeles, California

Editor's note: We contacted Intel and Dell about Mr. Solot's problem. Here's what we found out: Some early Chips and Technologies chip sets (governing interface I/O and memory) caused incompatibilities when used in conjunction with some high-speed 286 systems (12 MHz and above). The problem was identified early on by C&T and has been corrected. Early-model high-speed 286-based systems, however, could have the faulty chip set that causes compatibility problems.

Dell has changed the design of the System 220 to incorporate the new C&T chip set. The company has also replaced Mr. Solot's system board to correct the incompatibility. According to Dell representative Lisa Rohlf, the problem affects only System 220s with system boards classified as earlier than "A12." Customers experiencing compatibility troubles will receive a new system board free of charge if the computer is still under warranty. If the warranty period has expired, customers will be required to pay only an installation cost of roughly $60.

Intel offters a diagnostic program that identifies compatibility problems between system boards and math coprocessors. The program can be obtained by dialing in to the BBS at 503/645-6275 (8 bit, 1 stop bit, no parity). The math coprocessor test contains two files: CHKCOP.EXE and a README file. The diagnostics program is also included with the 287XL.

Tardy Rebate

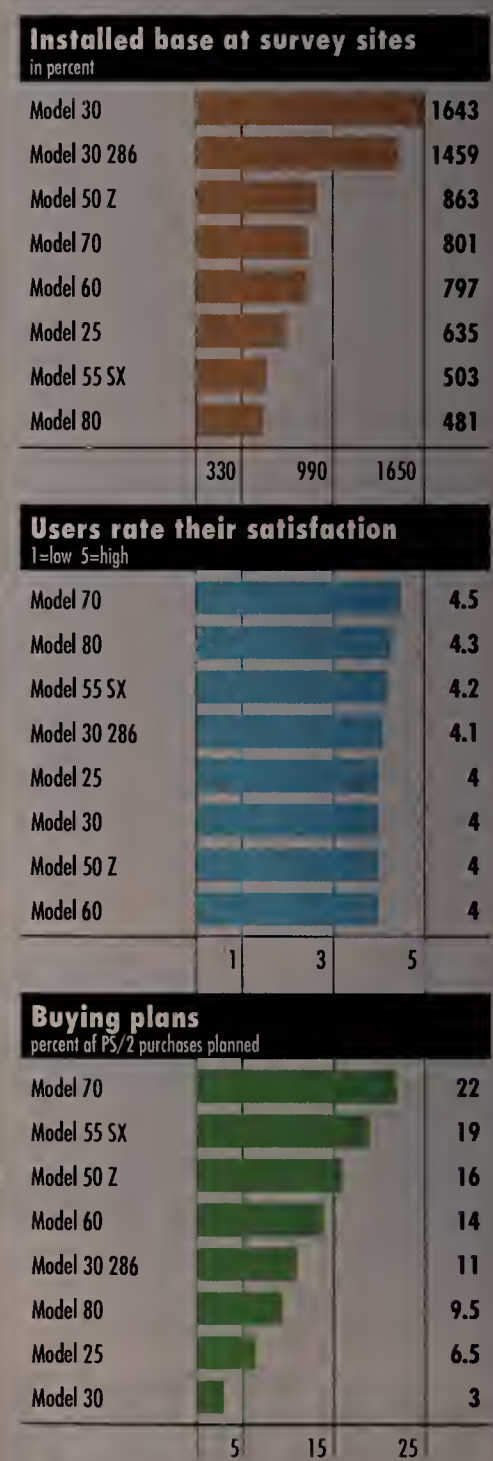
Last spring I bought *Freedom of Press* from Custom Applications. Included

(continues)

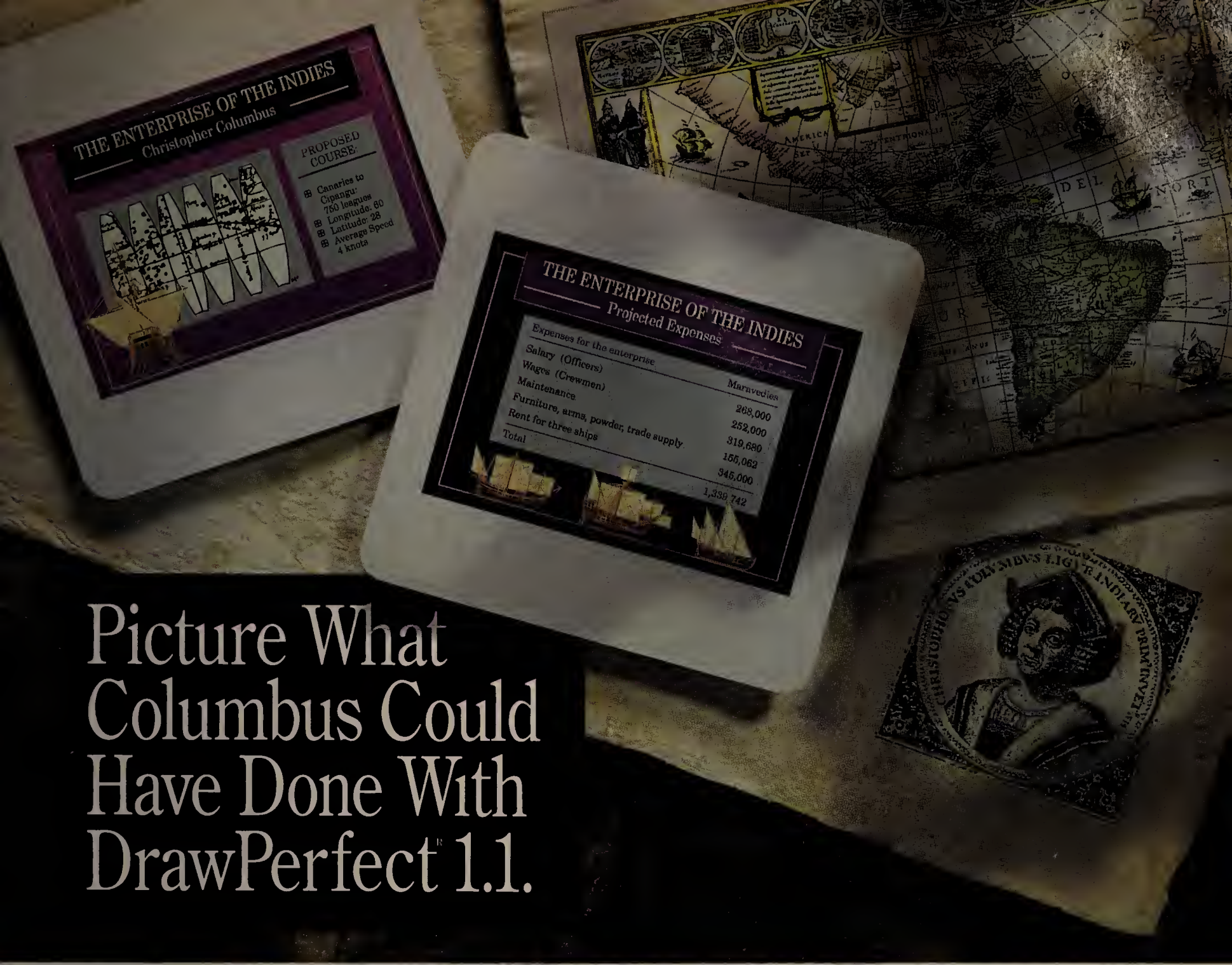
RATE YOUR SATISFACTION: IBM PS/2 Computers

Although it ronks only fourth omong the installed bose of IBM PS/2 computers ot survey sites, the smoll-footprint PS/2 Model 70 scores highest in both user sotisfaction ond in the plon-to-buy cotegory.

Respondents appear to be grodually moving awoy from the low-end PS/2 systems such os the Model 30 ond the Model 30 286. Although these systems have the lorgest installed base, they represent only o smoll proportion of the PS/2 computers users plan to buy, according to this survey.



Source: Internatianal Data Carporatian. Fram a survey af 200 large organizatians, each with at least 50 PCs. (Percents add up to more than 100 due ta raunding.)



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SERVICE EXCELLENCE

I called CompuAdd to inquire about a product called *Family Pac* and was told the item was in stock, with no indication that it was in short supply. As a result, I decided to hold off on the purchase. When I called back one week later, I found they were sold out and that the item would not be restocked in the foreseeable future.

I wrote a letter to the company, expressing my disappointment with what had occurred. A few days later I received a call saying that the CompuAdd staff had searched the warehouse and located one of the last remaining copies of the software I wanted.

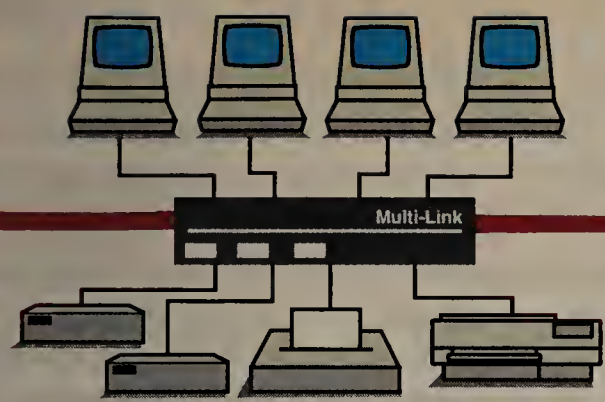
It's not often that you get service like this.

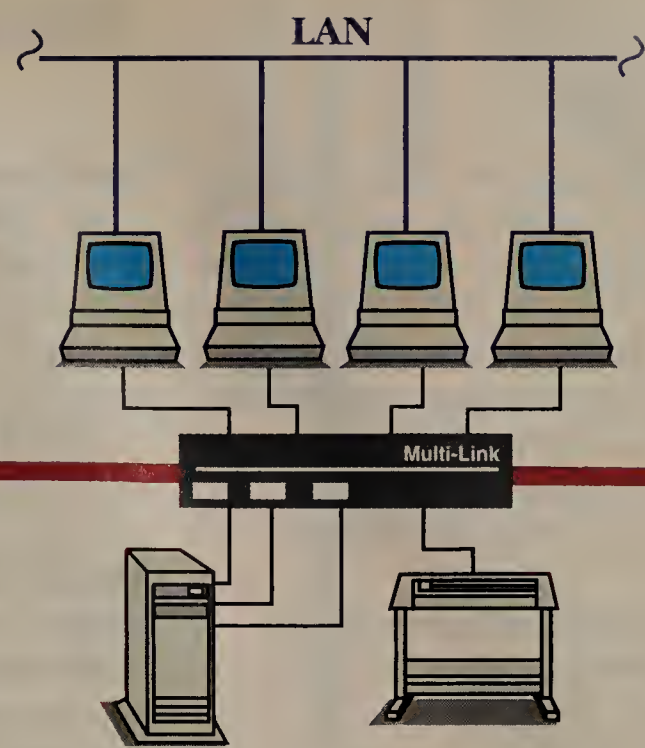
Jack Berdeaux
Seward, Alaska

with the software was a rebate coupon for $50. I mailed the coupon and the required proof of purchase but never received my rebate. I mailed a second letter several months later—still no reply. To the best of my knowledge, I followed CAI instructions to get the rebate. Can you help me get this rebate and a rational explanation of why Custom Applications ignored me?

Mark W. Kainu
Gualala, California

CAI responds: Our rebate program required customers to submit the rebate coupon, a copy of the invoice from CAI, and proof of purchase. Mr. Kainu's request did not include the proof-of-purchase sticker, so we couldn't process his rebate. Although we later sent a letter requesting the proof of purchase, we were delayed in doing so because we *(continues)*





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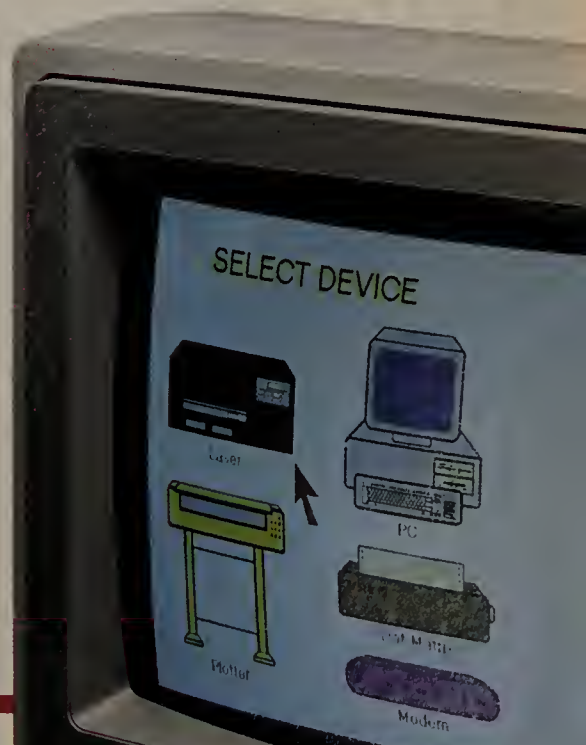

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were deluged with responses to this promotion, and the administrative mechanisms were not in place to handle such a volume of requests. As soon as the situation was under control, we went back to the incomplete rebate requests and requested missing documentation.

Dodie Bump
Product Marketing Manager

The Keyboard Was the Culprit

My problem concerns a 386 file server running Novell's NetWare 286 version 2.12. I have three 286 workstations and also use the server as a workstation.

Initially, the system worked very well and actually exceeded expectations, but I have since had problems with the server's keyboard. The current problem (sluggish response, erratic keystrokes, and blinking keyboard lights) isn't apparent at the DOS level or in the console command mode of NetWare ELS. The server keyboard is the only one affected, and then only while an application is loaded and running.

My dealer claims the problem lies with Novell's software since it occurs only when NetWare is loaded. Novell's response (after being contacted directly) was to send me back to my dealer.

Brett A. Mootsey
Detroit, Michigan

Novell responds: Mr. Mootsey bought a complete package from his dealer that included NetWare and some PCs that the dealer assembles and resells. But because of the way nondedicated NetWare (where the server can also be used as a workstation) handles interrupts, some clone keyboards do not function properly in this environment. We have provided Mr. Mootsey with information on a company, NMB Technologies, that sells keyboards certified by Novell to run in nondedicated mode.

We strongly suggest that dealers concentrate on products that are Novell certified to simplify ongoing support. Novell will support NetWare on any platform, but if the problem is hardware related and the hardware is not Novell certified, the responsibility falls on the dealer to work with the hardware manufacturer to resolve the problem.

Mr. Mootsey's dealer has chosen to resell computers that have not been certified by Novell and so has taken risks from a support standpoint.

Jan Newman
Director, Service and Support

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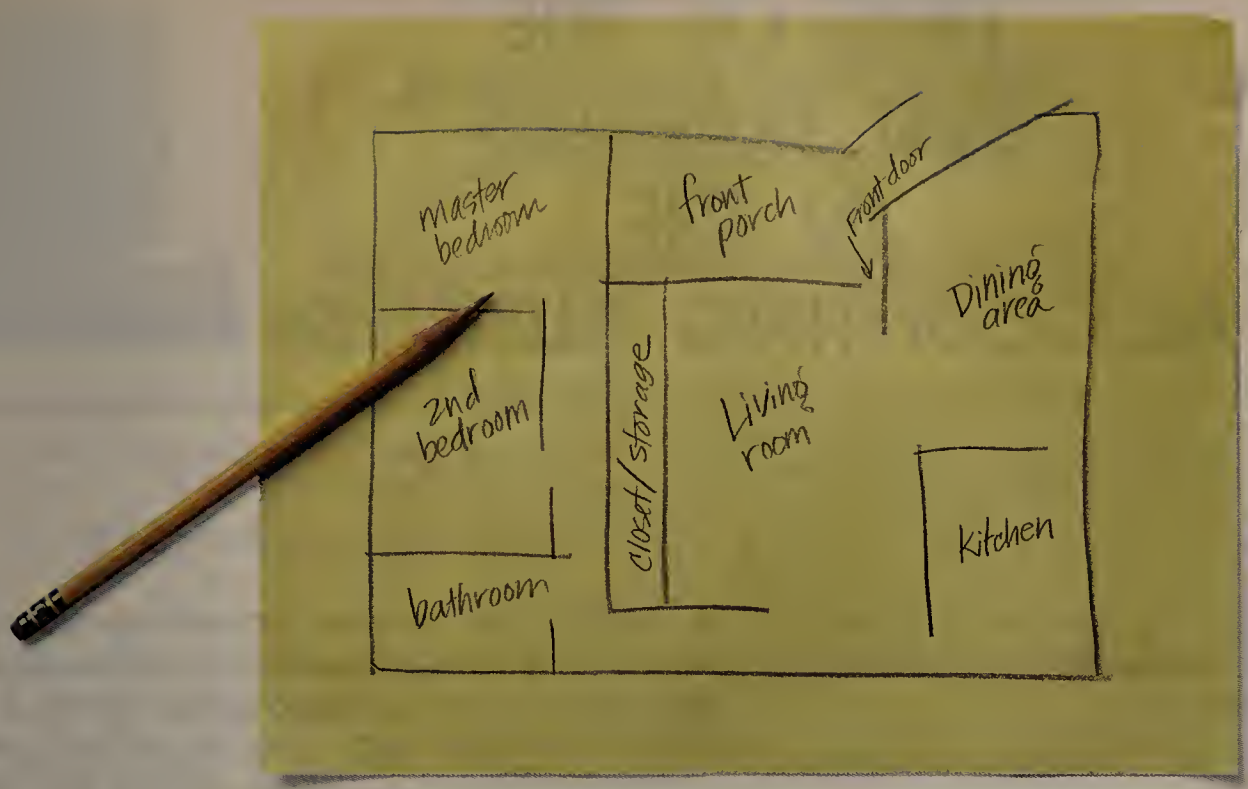

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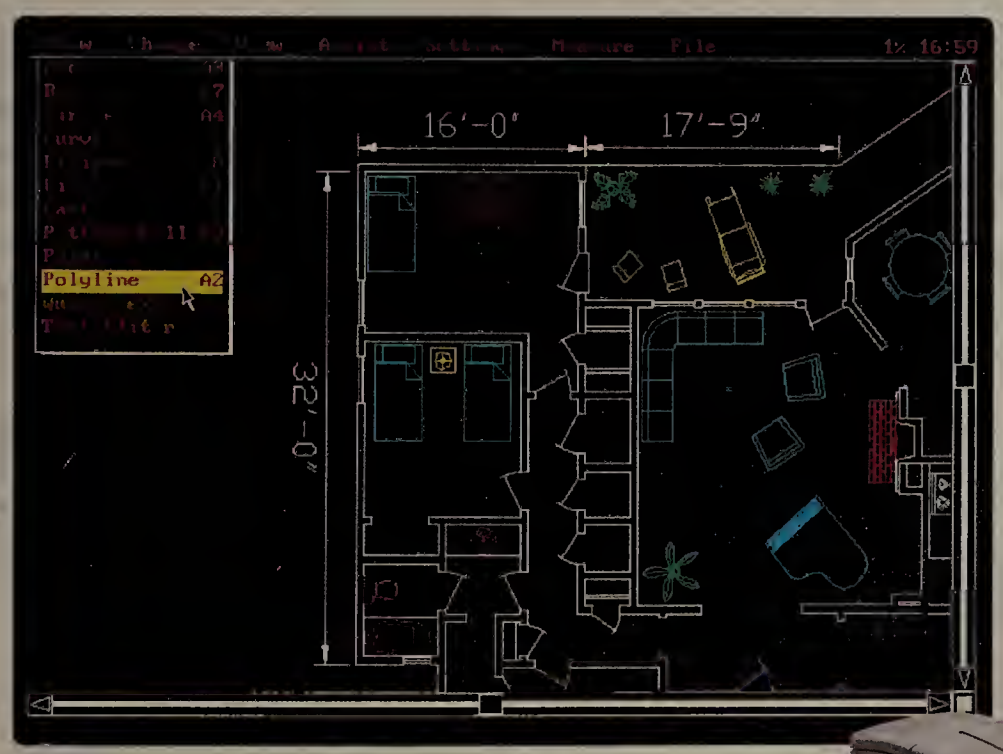

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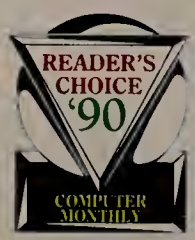

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MANAGER'S FILE #2

Does It Make Sense to Rent a PC?

Take a quick look through the yellow pages of your local telephone directory or the business section of any major metropolitan newspaper, and you'll find dozens of advertisements for PC rentals. Companies are springing up daily to meet the short-term computing demands of businesses and individuals. But why rent when the cost of even name-brand systems is relatively low, stretched out over five years?

It's a matter of simple economics, say executives from nationwide PC rental companies and business managers who've opted for this solution. As corporate budgets get tighter and companies cut back on capital expenditures, renting PCs can be more cost-effective than purchasing a system outright—*if* you need the hardware on a short-term basis.

A Compaq Deskpro 386/25, for example, has a suggested retail price of $8999 when equipped with a 110MB hard drive and 1MB of RAM (memory expansion units are sold separately). You can rent a comparable unit for around $600 per month (prices will vary depending on location). Although you won't get the tax advantages of depreciating the equipment over five years, you also don't have to struggle with getting approval for a major expenditure, *and* you can write off the rental price as a business expense.

Flexibility is a key issue when renting equipment. You can obtain hardware within 24 hours to meet any short-term or eleventh-hour need: peak work loads, temporary staffing changes, or delays in getting your own equipment repaired. Systems arrive preconfigured and ready to run. Rental agreements typically include complete service, including technical support and 24-hour product replacement should equipment fail. Some national firms, such as Businessland Rents, will even set up small networks and send an on-site technician to handle any problems (for a fee, of course).

Most national PC rental companies stock just about every type of hardware—from desktop and laptop computers to monitors, printers, plotters, and high-speed modems. Rentals are available for daily, weekly, or monthly use and can include from one to several dozen units. Many firms deal only in top-of-the-line equipment, although systems and peripherals from second-tier companies are usually available.

Product availability, price, and service vary among rental companies, so shop for the best deal, just as when buying PC hardware. Some companies build systems to order, while others are limited by the configurations they have in stock. In general, national firms with large inventories are better equipped to handle custom configurations or unusual orders, but don't rule out local firms. Competition is tight, and they may be more willing to negotiate rental terms than their larger competitors.

Is Renting Right for You?

Quick availability and flexible terms make renting a smart way of obtaining PC hardware for short-term needs. Do any of the following scenarios sound familiar? If so, then renting may be right for you.

Periodic business travel?	✔ **A rental company can have a notebook or desktop system waiting at your hotel.**
Special presentations?	✔ **High-end graphics boards and monitors can be rented for a few days or weeks while you prepare and give the presentation.**
Peak work loads, short-term staffing increases?	✔ **Rental units are available on 24-hour notice to meet fluctuating demands.**
Equipment being repaired?	✔ **Rent the same or comparable equipment to alleviate downtime.**
Considering a major purchase?	✔ **Evaluate new products from major vendors before committing to a large purchase.**

NATIONAL PC RENTALS

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dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modem pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARDS			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audits & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

Trademark/owner: dBASE IV, Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corp. Other company or product names mentioned may be

dTruth Comes Out.

Software Digest® RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 7, Number 13

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 7.0–10.0 ■ 5.0–6.9 ■ under 5.0

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

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Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.

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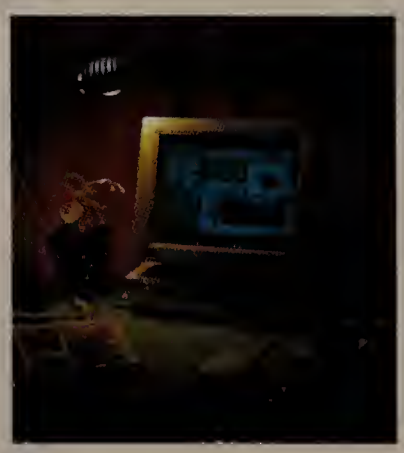

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Circle 77 on reader service card

Edited by ERIC BENDER

How Far Can Excel Ride Windows?

Spreadsheet Clash Improves User Choices

Lotus Users Stick by 1-2-3 but Await Windows Version

Lotus will lose customers unless it ships its Windows spreadsheet soon, warns Home Mutual Life's Howard Brenner.

WALTER CALAHAN

Putting its muscle behind the impressive *Excel 3.0*, Microsoft has kicked off another intense round of competition in spreadsheets—a contest that's already giving users lower prices, cheap upgrades, and free add-ins.

Chairman Bill Gates declares that *Excel 3.0* will ensure Microsoft's dominance in *Windows* spreadsheets this year despite upcoming entries from Lotus and Borland, and he cheerfully predicts that a majority of new PCs will be running the graphical environment by year-end. To help that along, he is offering *Excel* for $99 to *Windows* seminar attendees and for $129 direct from Microsoft.

Lotus is firing back by bestowing $20 copies of its newly acquired *Ami Pro*, a $495 *Windows* word processor, on purchasers of *1-2-3* release 3.1. Upgrades from release 3.1 are only $49 for six months after purchase. Meanwhile, on the low end, Borland continues to give the $495 *Quattro Pro 2.0* to anyone with $100 and proof of *1-2-3* ownership.

Lotus's lead keeps weakening. Marshall Moseley, software analyst with Dataquest in San Jose, California, says that its share of all personal computer spreadsheets slid from 54 percent to 47 percent in 1990. *Quattro* climbed from 3 percent of unit sales in 1989 to 14 percent. *Excel*'s gains were modest—from 12.6 percent to 14 percent—but that was before *Excel 3.0* hit shrink-wrap.

This year, Moseley predicts, *Excel* will carve more market share from *1-2-3*, as will *Quattro Pro*. But the real losers will be character-based alternatives such as *SuperCalc 5* and *Lucid 3-D*. "Low-end [packages] will disappear," says Moseley.

1-2-3 Loyalists Hard to Budge

Lotus keeps cranking out versions of its franchise product; *1-2-3 3.1* fills a major gap with its built-in spreadsheet publishing facilities, and release 2.3 is expected soon. But Lotus's greatest strengths are the 7 million copies sold and a loyal user base that won't switch overnight, even when competing packages may be richer in features and easier to use.

"I'm very happy with the functionality of *1-2-3* release 3.1," says Tim Arnold, senior engineer with Redpath Engineering in Mesa, Arizona. "Now I can give output that looks as good as *Excel*'s did, off the spreadsheet I was using before."

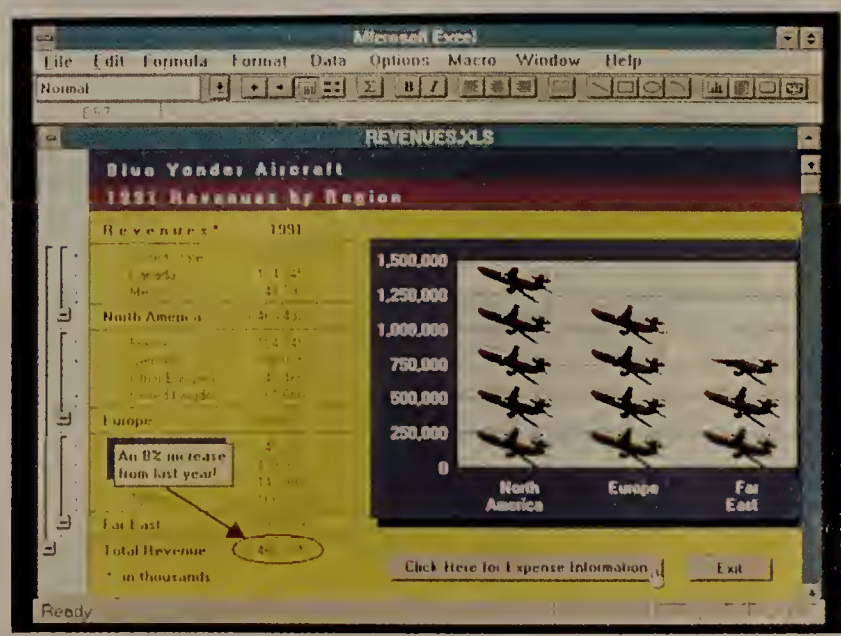
"We're very entrenched," says Billie Kjeell, director of the Irvine, California, computing center for Fluor Daniel. "The cost to this corporation if we moved to *Excel* or *Quattro* would be astronomical."

To many *1-2-3* users, all the giveaways and discounts are irrelevant. The *Ami Pro* offer is "a nonissue," says Benjamin Goldfarb, manager of information services at StarKist Seafood in Los Angeles. "There are too many issues in changing shrink-wrapped software beyond free [packages,] such as training or the learning curve."

The same goes for Lotus's guaranteeing *3.1* buyers $49 upgrades to any new release within six months of purchase. "That's a nice gesture," says Goldfarb. "We want the upgrades to go as smoothly as possible. But that's just a part of our decision to stick with Lotus."

Still, half the users of release 3.1 run it under *Windows*, and corporations are clamoring for *1-2-3 for Windows*, expected this summer. "If Lotus doesn't get its *Windows* version out, people will move over to something else," warns Howard Brenner, executive vice president for Home Mutual Life in Baltimore. "That doesn't mean [the alternative] is a better product. [*Windows* is] just the environment people want to work in."

—*Mark Henricks*



Microsoft is pushing Excel 3.0 hard, attempting to shut out Windows alternatives expected from Lotus and Borland.

IBM Backs NetWare as Network Alternative

Falling-Out With Microsoft Triggers Novell Alliance

This was not quite business as usual for IBM.

IBM's February agreement to resell Novell's NetWare, and help integrate the best-selling network system software into its grand computing scheme, promises to ease headaches for many corporate customers.

But slapping a Big Blue logo on a product that competes head-on against a key IBM offering is hardly standard practice. And the move publicly acknowledges a deepening rift with system software partner Microsoft.

Analysts agree that the step boosts IBM's control of its networking future. "Strategically, it's important for IBM to move away from Microsoft," says David Marshak of Patricia Seybold's Office Computing Group in Boston.

Big Blue Skies for NetWare

Since 1987, IBM has been pushing customers toward OS/2 *LAN Server*, based on Microsoft's *LAN Manager*, as the foundation for local-area networking. IBM will continue to develop *LAN Server* actively; the Novell alliance simply acknowledges NetWare's entrenched position, says Jim Cannavino, head of IBM personal systems. "The vast majority of our customers will have both in their shops," he explains. "We will support both products equally."

The two firms will collaborate to make NetWare and *LAN Server* work together (for example, giving users a single log-in for both) and to meld NetWare more smoothly into IBM's overall Systems Application Architecture (SAA) blueprint for distributed computing. One crucial part of the agreement: Novell promises to offer a full-blown NetWare for OS/2 next year. "Our strategy is to make OS/2 a unifying platform," declares Cannavino. "Our commitment is as strong as ever."

"The need for integration and coexistence is clear," says Lee Reiswig, assistant general manager for programming, IBM desktop systems. Solving today's fiendishly complicated networking problems requires plenty of cooperation among vendors anyway. Adds Reiswig, "If we had to have all these relationships, why not benefit financially?"

While many customer needs overlap, Reiswig points out that the products offer different strengths. *LAN Server* was meant to be a cornerstone for SAA networks and for OS/2 applications developed in-house. Novell provides higher performance, links to other machines like the Macintosh, and fault tolerance and will add multiprocessing support in the future.

However, plenty of questions about specific product plans remain. "I don't think IBM and Novell have got all their ducks in a line," says Michael Goulde of Open Systems Advisor in Boston.

Separating From Microsoft

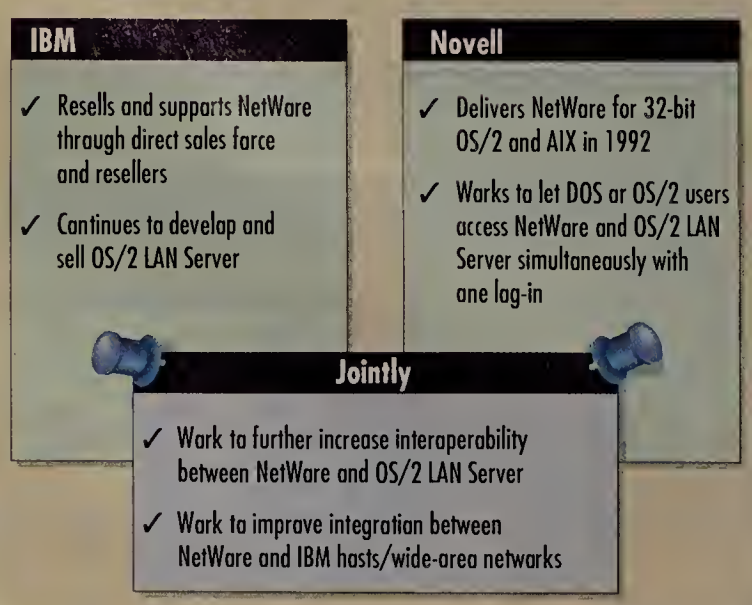
The announcement came two weeks after Microsoft all but danced on the grave of today's OS/2—touting the brand-new operating system it will invent under the name OS/2 3.0 and encouraging developers to write applications for *Windows* rather than for OS/2. These actions infuriated IBM. While executives stoutly deny it, "a lot of this move is personal," one analyst says.

With IBM's product focus broadening, and with 3Com, the largest supplier of *LAN Manager*–based packages, essentially withdrawing from that business, *LAN Manager*'s position has been battered. "3Com's already bailed out, and IBM and Hewlett-Packard are doing similar things," observes Marshak. "Microsoft won't stem the NetWare tide this year."

But the Novell deal "doesn't change our direction," insists David Thacher, senior product manager for the *LAN Manager* line. "To us it doesn't look like a huge shift; it's a very pragmatic step in response to customer requests."

"Microsoft has begun an enormous drive to launch *LAN Manager*," notes Thacher, who expects Microsoft to reach its goal of 600 high-end resellers by midyear. In recent months, Microsoft's network product group has hired hundreds of employees—substantiating the $1.5-billion giant's commitment. —*E. B.*

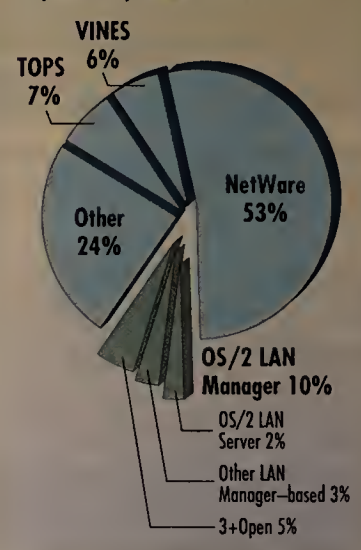
Under the IBM/Novell Agreement...



Following the IBM/Novell deal, customers buying net system software from both firms will benefit from closer product integration. IBM still sees OS/2 as a unifying base platform.

NetWare Easily Leads in Network Software

Percentage of 1990 worldwide shipments by number of users



Novell's NetWare retains a firm hold on the PC-based–network software market, according to International Data Corporation. Sales of OS/2 LAN Manager–based offerings are climbing but not at Novell's expense. IDC estimates last year's worldwide market at 6.5 million users.

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HWP — *5 Ports*

HWP-256	with 256KB	$325
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From 256KB to 16MB buffer

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All parallel ports; user configurable as either three inputs to two outputs, or four inputs to one output, buffered auto-switch

Rapid Data Transfer – 100,000 cps:
The HWP uses Direct Memory Access (DMA) for data transfers into the buffer, making the HWP hardware capable of receiving parallel data at the high rate of 100,000 characters per second.

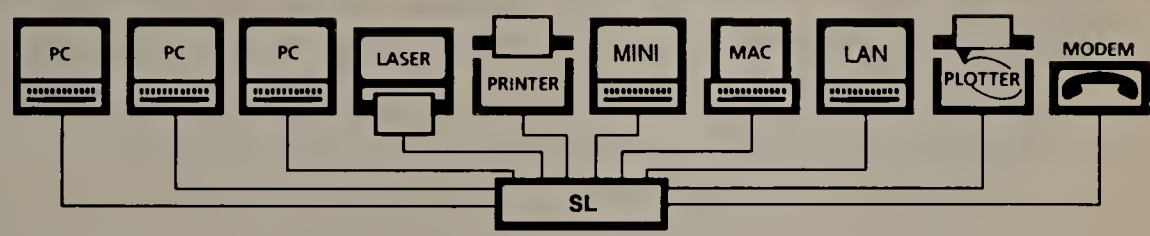
Pop-up Menu or Front Panel Buttons:
Use either the pop-up menu or the front panel switches to select printers, select the next available printer, send multiple copies, clear data, and other functions.

AS-41 — *5 Ports* — *$200*

Smart Switch – No Pop-up or Buffer:
Four parallel inputs to one parallel output, electronic automatic switch with no buffer

SPPS — *(not shown)* — *$100*

Interface Converter – No Buffer
Combination serial-to-parallel, or parallel-to-serial interface converter in a single unit; low-power CMOS design derives power from serial connection, no power supply needed; supports 9,600 to 115,200 bps, DIP switch configurable



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Pop-up Menu via Hotkeys or Mouse:
Keyboard selection of printers and many other control functions; pop-up is for convenience, but is not required

Simple Installation:
Plug in your cables; if desired, run the installation software for the pop-up menu

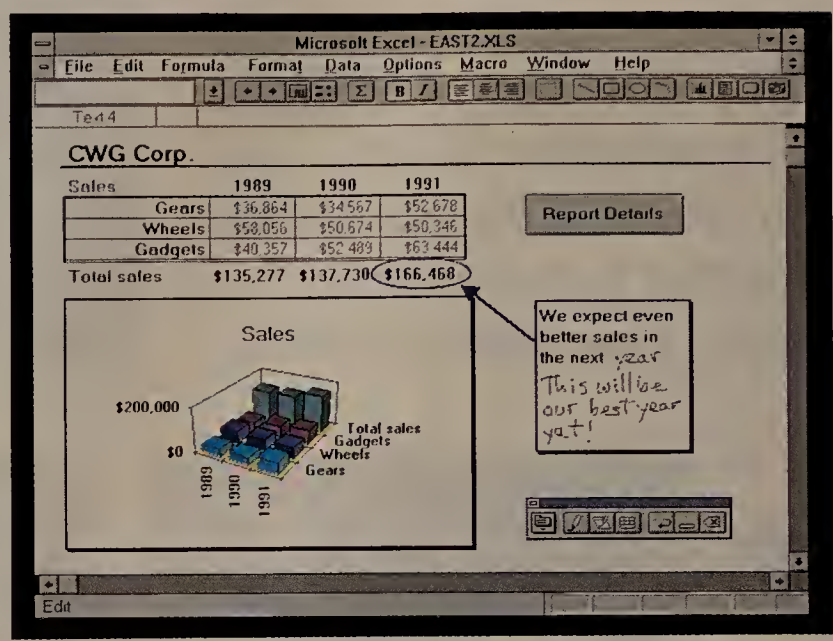
Capitalizing on the Power of the Pen

Go, Microsoft Vie for Backers in Computing's Next Wave

Months before products will hit the market, debate is rising over the future of pen-based computing, which promises to bring greater ease of use and portability to PCs for managers and professionals. The combination of a pen interface and an extremely lightweight package also should bring computer power to businesspeople who've been left behind in the PC revolution.

Go Corporation and Microsoft are busily lining up hardware and software backers for PenPoint and *Pen Windows*, their respective environments (see "PenPoint Puts It in Writing," March 1991). Go's elegant built-from-the-ground-up solution represents a complete departure from conventional ways of working with a computer. Microsoft, on the other hand, is playing catch-up by adapting *Windows 3.0* to exploit a pen interface.

Both Go and Microsoft are beating the drums to get software developers moving on the all-important process of writing applications. But users shouldn't expect to see finished hardware and software until year-end at the earliest.



Microsoft claims that existing Windows 3.0 applications will run essentially unmodified under Pen Windows.

New Breeds of Users?

Everyone is wrestling with uncertainty about how the products will be employed once all the pieces come together.

Go executives contend that most users of pen-based systems will be people who either can't or won't use today's PCs. Microsoft takes a more evolutionary view, arguing that most customers will be looking for a highly portable supplement to their desktop system.

In the first few years, the biggest market for pen-based systems is likely to be field representatives—from sales professionals to delivery personnel—for whom today's laptops are largely inappropriate. Form software will play a critical role; packages like Slate Corporation's *PenApps* for PenPoint and Borland's *ObjectVision* for *Windows* are among the form-oriented tools that will provide an easy way for field representatives to capture data.

PenPoint should enjoy distinct technical advantages over *Pen Windows* among these early adopters. PenPoint's Notebook User Interface spares users the worry of such typical PC issues as file location and directories. Its more intuitive approach should appeal to users who aren't familiar with desktop PCs, making PenPoint's incompatibility with existing software less of a concern. For many of these users, "*Windows* doesn't mean anything," points out Bill Lempesis, publisher of *The Lempesis Report* in Pleasanton, California.

Further down the road, however, mobile managers and executives—including both PC veterans and novices—will make up a large segment of users of pen-based systems. Here *Pen Windows* may well be the system of choice, says Andrew Seybold, associate director of Dataquest's microcomputer systems service. "For individuals who are computer literate in the *Windows* environment, *Pen Windows* will be the ideal traveling companion," he notes.

Microsoft argues that *Pen Windows* will offer an entry into pen-based computing without making users shed their existing applications. "The problem of having a new platform is that the platform doesn't exist until application software is available," says Pradeep Singh, group product manager for *Pen Windows*. "We've solved that problem."

But an existing operating system retooled for pen input can't do the job, maintains Jerry Kaplan, chairman of Go in Foster City, California. "The pen isn't just another input device," says Kaplan. "The pen is the point."

Backing Both Horses

"The two companies will be fighting a battle for the same turf," says Ken Dulaney, director of advanced systems marketing at Grid Systems in Fremont, California. Many software and hardware companies are hedging their bets.

Grid and NCR, the two hardware suppliers that have been most public about their plans, will offer products capable of running either PenPoint or *Pen Windows*—letting users decide which of the two operating systems will best *(see Pen, p. 66)*

Which Pen-Based Interface Will Win?

Microsoft and Go court software and hardware support.

	MS's Pen Windows	Go's PenPoint
Software companies	Contact Software, DaVinci Systems, Delrina Technology, FutureSoft, Poloris, Slate	Bell Atlantic, Borland, Claris, Lotus, Nantucket, Novell, PenSoft, Sitka, Slate, Softview, WordPerfect
Hardware companies	Epson, Fujitsu, Grid, Hitachi, Kyocera, Momenta, NCR, NEC, Sharp, Toshiba, Wang	Grid, IBM, NCR

Microsoft has garnered numerous backers, hoping that Pen Windows will be the environment of choice for pen-based computing. Go counts industry heavyweights IBM and WordPerfect among its PenPoint supporters. Many vendors may end up endorsing both.

KEITH BAUMANN

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Pen

(continued from p. 62)

meet their needs.

But Mountain View, California, start-up Momenta Corporation, one of the first public backers of *Pen Windows*, currently has no intention of supporting PenPoint. Marketing Vice President John Rizzo describes the firm as a "systems company," noting that an initial offering planned for delivery early next year will be a hardware/software combination, including software tools, pen-optimized applications, and handwriting algorithms.

While Go includes IBM among its most vocal backers, Microsoft has lined up some of the biggest laptop suppliers. Toshiba, NEC, Epson, and Sharp have all endorsed the *Pen Windows* environment (although none gives any product details).

Pen-based systems will be 386SX-based. Grid plans to offer a hard disk, but NCR will include only flash memory and battery-backed RAM storage for increased portability. (PenPoint can work well without a hard disk, *Pen Windows* may not.) Early penbooks should weigh in at about 5 pounds, measure 9 by 12 by 1 inch, come with at least 4MB of RAM, and retail initially for between $4000 and $5000.

Penning Innovative Applications

Startups PenSoft and Slate are leading the development of pen-specific applications and expect to release finished products when the pen platforms are available at year-end. Both companies played a key role in the January PenPoint unveiling but in addition may offer *Pen Windows* versions.

PenSoft's personal information manager is a showpiece for packages that pull together the many advantages of a pen-based system. It allows for single entry of most information and enables users to establish links between different types of data in different applications. The software will incorporate E-mail and be fully programmable, so corporations and resellers can customize applications.

Go has also lined up major players including WordPerfect, Lotus, and Borland. WordPerfect intends to provide a version of its franchise word processor for PenPoint, but Product Marketing Director Royce Bybee emphasizes that the company is still determining which features are most appropriate and what new tricks make sense in a pen-based environment.

"It's clear you're not going to create a 20-page document on a pen-based system" says Bybee. He adds, though, that pen-based systems will be invaluable for editing documents, taking notes, and creating short letters or memos.

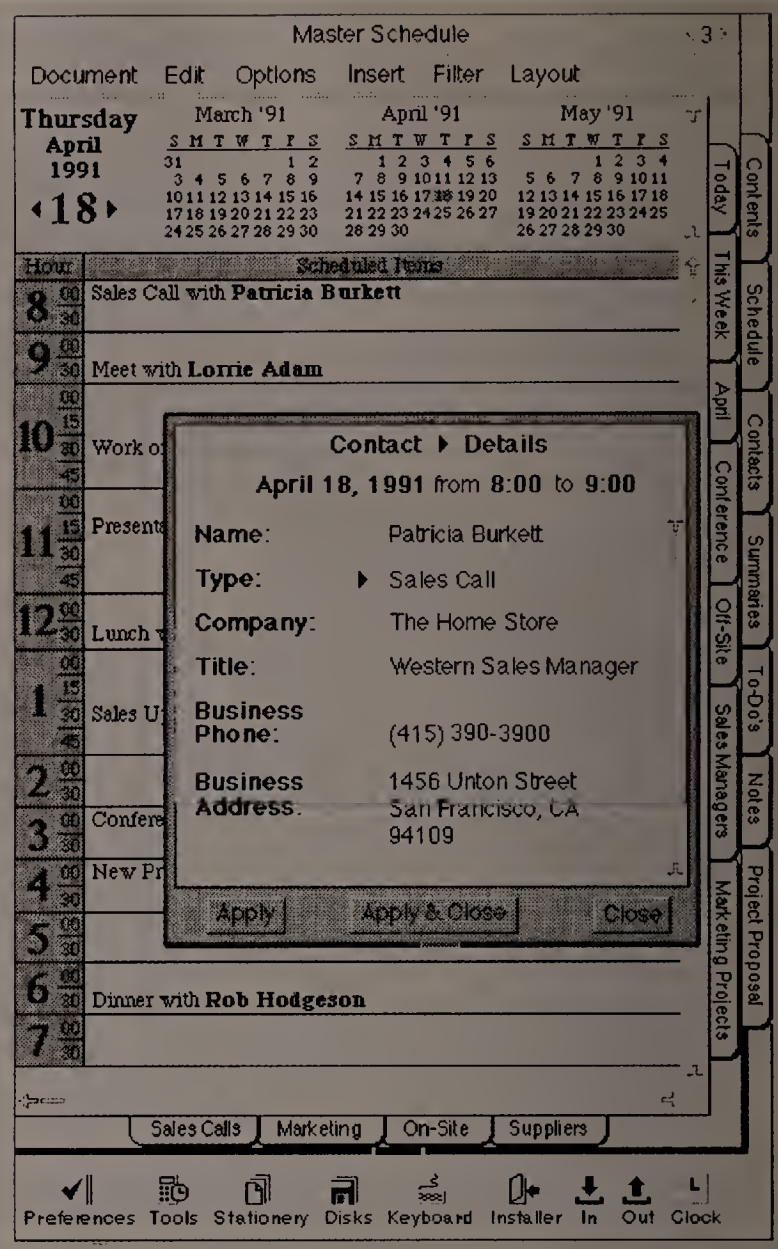
Microsoft, meanwhile, is lining up its own list of followers, including Da Vinci Systems and Polaris Software. And all the major software houses are studying *Pen Windows* very seriously.

Customers Watch and Wait

Despite all the speculation, the ultimate place and power of pen-based technology remain largely unknown. Several large corporate users express interest in the technology, but because the new platforms may offer an edge on the competition, they're mum about specific plans.

"Everyone has a lot of ideas," says Seybold. "Six months after the products are on the market, people will be rethinking the issues and the [appropriate] applications."
—*Roberta Furger*

Mark Henricks is a contributing editor for PC World.



PenSoft's PIM is designed for easy customizing.

The Language of Pen-Based Computing

A sampling of gestures key to pen-based operating systems

Action	PenPoint	Pen Windows
Select	(tap) Selects or activates what you touch with the pen. In text, selects one character.	Selects the information under the gesture.
Delete	Deletes a word or selection in text or any object directly beneath the X.	Deletes character to the left of the starting point of the gesture.
	Deletes a character in a writing or edit pad character box, or an individual character in text.	(double-strike) Selects and deletes information under the gesture.
Correct	Opens an edit pad for a word or selection in text, text fields, and labels.	Corrects word and displays it in the writing window.
Insert	In text, pops up a small writing pad to insert a word. In the Table of Contents, pops up the Create menu to create a new document.	Pastes the Clipboard's contents at the top point of the gesture.

The ease of adapting to pen-based computing will depend largely on how intuitive you find the gestures that are fundamental to both PenPoint and Pen Windows.

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Circle 22 on reader service card

PC WORLD STREET PRICE LIST

What to pay at retail for PCs, based on IDC's PC Pricing Report survey.

PC WORLD

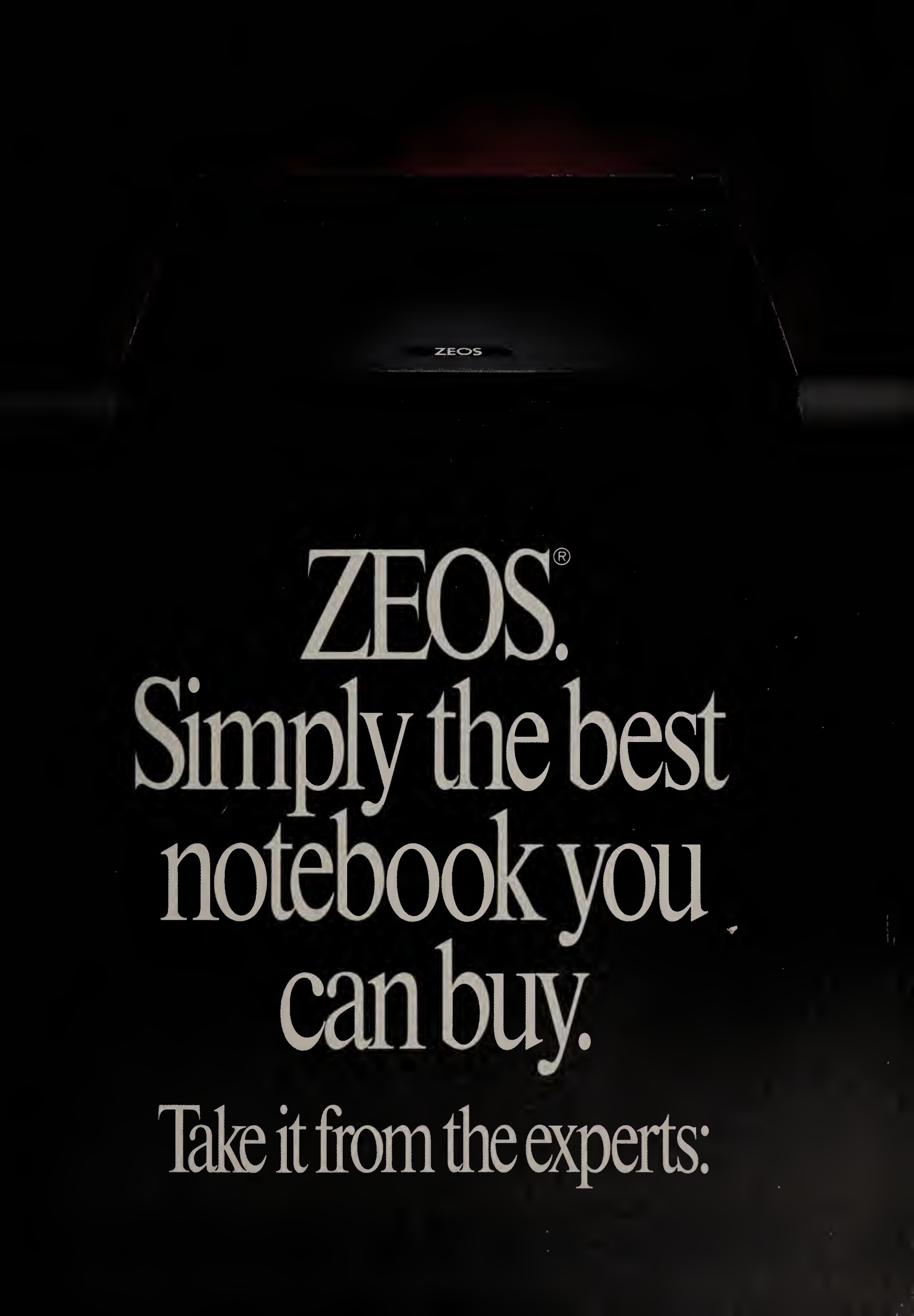
	National				Metropolitan							
	List	Average	Low	High	Boston	Chicago	Dallas/ Ft. Worth	Los Angeles	Miami/ Ft. Lauderdale	New York	San Francisco/ Bay Area	Washington, D.C.
80286-based desktop PCs												
AST Bravo/286	$1695	$1280	$975	$1526	$1328	$1254	$1158	$1238	$1356	$1267	$1322	$1294
Compaq Deskpro 286n	$2399	$1807	$1350	$2159	$1818	$1829	$1779	$1808	$1837	$1815	$1772	$1781
Dell 210	$1500	$1500	n/a	n/a	$1500	$1500	$1500	$1500	$1500	$1500	$1500	$1500
IBM PS/2 50Z-031	$2745	$2048	$1647	$2416	$2042	$2135	$2237	$1871	$1969	$2091	$1994	$2131
Tandy 2500 XL	$1959	$1959	n/a	n/a	$1959	$1959	$1959	$1959	$1969	$1959	$1959	$1959
80386SX-based desktop PCs												
AST Bravo/386SX	$2845	$2136	$1687	$2561	$2185	$2106	$2057	$2053	$2276	$2048	$2219	$2091
Compaq Deskpro 386s	$3199	$2422	$1969	$2879	$2425	$2413	$2380	$2399	$2457	$2511	$2295	$2385
Dell System 316 SX	$1700	$1700	n/a	n/a	$1700	$1700	$1700	$1700	$1700	$1700	$1700	$1700
Epson Equity 386SX Plus	$2999	$1779	$1349	$2159	$1897	$1828	$1751	$1661	$1703	$1827	$1674	$1703
IBM PS/2 55-061	$3895	$2917	$1999	$3428	$3016	$3030	$3175	$2678	$2807	$3040	$2791	$2944
NEC PowerMate SX+	$2999	$2073	$1500	$2699	$2062	$1947	$2077	$2324	$1899	$2088	n/a	$1908
80386DX-based desktop PCs												
AST Premium 386/25	$5595	$4202	$3490	$5036	$4420	$4140	$3954	$4006	$4464	$4057	$4225	$4328
Compaq Deskpro 386/33L	$9999	$7546	$5852	$8999	$7579	$7508	$7390	$7549	$7749	$7674	$7357	$7233
Epson Equity 386/25	$4999	$3633	$2595	$4499	$3869	$3809	$3649	$3374	$3432	$3596	$3601	$3668
IBM PS/2 70-061	$4745	$3563	$2847	$4176	$3445	$3691	$3867	$3367	$3404	$3674	$3498	$3685
IBM PS/2 70-A61	$6245	$4734	$3747	$5496	$4860	$4858	$5090	$4655	$4512	$4835	$4542	$4721
Tandon 386/33	$3879	$3879	n/a	n/a	$3879	$3879	$3879	$3879	$3879	$3879	$3879	$3879
Tandy 4033 LX	$5898	$5898	n/a	n/a	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898
80486-based desktop PCs												
AST Premium 486/25E	$8595	$6430	$5000	$7736	$6790	$6360	$6194	$6417	$6533	$6275	$6489	$6110
Compaq Deskpro 486/33L	$13,999	$10,717	$8959	$12,599	$10,681	$10,658	$10,837	$10,624	$10,763	$10,879	$10,622	$10,339
Dell 425E	$6000	$6000	n/a	n/a	$6000	$6000	$6000	$6000	$6000	$6000	$6000	$6000
IBM PS/2 95 XP	$17,745	$13,355	$10,647	$15,616	$12,885	$13,770	$14,462	$13,140	$12,819	$13,686	$13,131	$13,167
NEC PowerMate 486/25E	$12,499	$6937	$4950	$8167	$7424	$6874	$6855	$7672	$6436	$7144	n/a	$6116
Portables/laptops												
Compaq LTE	$2699	$2046	$1727	$2429	$2015	$2031	$1989	$2066	$2065	$2038	$1992	$2066
Compaq LTE/286	$3499	$2614	$2198	$3149	$2675	$2663	$2416	$2588	$2629	$2612	$2563	$2552
Dell 320LT	$3899	$3899	n/a	n/a	$3899	$3899	$3899	$3899	$3899	$3899	$3899	$3899
Epson Equity LT-386SX	$5598	$3604	$2540	$4498	$3879	$3818	$3748	$3134	$3221	$3458	$3705	$3909
IBM P70 386	$7695	$5828	$4130	$6926	$5604	$5597	$6272	$5980	$5556	$5958	$5714	$6094
Toshiba T1000SE	$1499	$1062	$840	$1349	$1120	$1077	$1050	$1023	$1139	$1026	$1038	$1014
Toshiba T3100e	$4299	$2694	$1939	$3329	$2756	$2753	$2257	$2556	$2713	$2714	$2628	$2742

From an IDC survey of more than 180 computer dealers in eight metropolitan areas. Figures based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor.

Miami, Boston Offer Lowest Pricing for IBM's High End

Retail pricing for the IBM PS/2 Model 95 XP in eight metropolitan regions

While IBM's 33-MHz PS/2 Model 95 XP lists for $17,745, International Data Corporation's February survey found prices ranging from $10,647 to $15,616.



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F3
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F5
F6
F7
F8
F9
F10
F11
Tab
Caps Lock
Shift
Ctrl
Alt
Fn

A few expert opinions:

"There's a new king of the hill–the ZEOS Notebook..." — PC Magazine *"This notebook is a steal."* — InfoWorld *"In this category I'm most impressed with the ZEOS Notebook...it has to be the number one contender."* — John C. Dvorak

"The best price performer in its category." — Home Office *"An outstanding value."* — PC Week *"Impressive"* — PC Sources

Impressive Indeed! And The Price?

ZEOS NOTEBOOK '286 AND 386SX

Light and Loaded.

"THERE'S A NEW KING OF THE HILL"
—PC MAGAZINE

"King of the Hill... Impressive... The best price-performer... An outstanding value... A steal... The number one contender..." We couldn't have said it better ourselves. The experts love the new ZEOS Notebook. And you will too. At only $1995 for our '286 version and $2295 for our new 386SX, you simply can't find a better notebook anywhere!

As PC Magazine said, the ZEOS Notebook "offers a top notch combination of power, weight, features and price..." And you can pick your power! Choose our '286 version or go for the incredible new ZEOS '386SX. Combine either with our high speed hard disk, built in 1.44MB floppy drive, VGA and more—you've got the greatest notebook going at any price!

INCREDIBLE DESKTOP FEATURES IN A NOTEBOOK.

In fact, it's really like owning a 6.5 pound desktop that you can take with you anywhere! Look closely at the details. Like our crisp 10" VGA display. The ultimate in sparkling clarity, it features advanced fluorescent backlighting for vivid VGA graphics. Then, the drives.

Two drives are better than one! First, your notebook will include our whisper quiet high speed, high capacity hard disk. It will read and write your data so fast chances are you'll hardly know it's there. Then we're building in an industry standard 1.44 Megabyte 3.5 inch floppy as well.

While most notebooks don't include a floppy drive at all, you're really going to appreciate your ZEOS notebook's industry standard 3.5" floppy. It makes loading software and transferring files a breeze. Simply toss in your 1.44 and it's done. Anyway, can you imagine a desktop system without a floppy? We couldn't either. That's why your ZEOS notebook has one. It's great!

But the features of your incredible new ZEOS Notebook don't just stop there. Detail after detail we're giving you more than anyone else. Much more, for much less. Take a closer look.

DETAILS MAKE THE DIFFERENCE!

For instance, the battery system of your new notebook is the most advanced on the market. You can quick charge, or trickle charge, any time your system is plugged in. You can also take the battery out and use the optional charging stand if you wish.

Either way, you're sure to appreciate our light weight snap-in, snap-out battery packs. They're so light and easy to use, you can easily take an extra one with you on those really long trips. You can get even more life out of a single charge by using our programmable power management system. Hour upon hour of Notebook computing power!

CONNECTIVITY TOO!

Your new ZEOS notebook is a great connectivity tool. Utilizing our optional built-in 2400 baud MNP Class 5 modem, connectivity buffs will find themselves logging on at every turn. And speaking of connectivity, we've kept the I/O easy to use too. Because unlike many of the others, your new ZEOS notebook has the same industry standard port connectors you'll find on your larger desktop system. Completely compatible! Serial and Parallel ports; even an external VGA connector. All industry standard and ready to go the minute you receive your system.

It's attention to detail that makes the difference. Tens of thousands of hours of development time have been invested. We've been thinking and re-thinking exactly what you want in a notebook, and now we're building it for you. We think you'll agree, it's an incredible product. Plus, your new notebook is backed by the best support in the industry, 24 Hours a Day.

From $1995!

Now, you can take desktop computing power anywhere! The incredible ZEOS Notebook.

ZEOS 24 HOUR A DAY SUPPORT.

After all, it was ZEOS that invented 24 Hour a Day Toll Free Sales and Technical Support. We're always here to help. Any time you need us your telephone is a Toll Free Hotline—direct to your own personal Technician. 24 Hours a Day, 365 Days a Year. Now that's ZEOS value. But we don't stop there either.

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The ZEOS Guide to the Perfect Notebook:

PROCESSOR: PC Magazine recommends a '286 or '386SX processor pointing out that "8086- and 8088-based portables have only half to a third of the computing power of a 286." That's why ZEOS offers you your choice, '286 or 386SX! More power for you. After all it's just like a 6.5 pound desktop!

DRIVES: *Two drives, built in!* A whisper quiet high speed 20 Megabyte hard disk *plus* a 1.44 Megabyte 3.5 inch floppy. Remember, with a built in floppy drive you don't need to fool around with strange interfaces to load and transfer files.

VIDEO: ZEOS raises the ante to VGA! We're talking about bright and crisp VGA displayed on one of the largest notebook screens in the industry. The display also features advanced fluorescent backlighting, 32 grey scales and 640 x 480 resolution. Plus, it can be adjusted to any position over a 135° angle and features easily adjustable brightness and contrast controls. Easy viewing under virtually any lighting conditions. You can connect to an external VGA color monitor too!

GREAT BATTERY FEATURES: Every battery feature you want. You can plug your notebook in and "quick charge" the battery in less than one hour or you can "trickle charge" while in use. Plus, your battery easily snaps out allowing the quick installation of an optional replacement battery. It's great to be able to carry a light weight spare for those especially long trips. An optional battery charger stand is available as well.

INTELLIGENT POWER MANAGEMENT: Your new ZEOS notebook features an intelligent programmable power management system if you wish to use it. Based on the length of time since your last keystroke, you may reduce CPU speed, display screen backlighting etc. Full power is immediately restored at the stroke of any key. The system even knows *not* to use the power management system when you are operating on AC power!

CHECK IT OUT!

Now, you can take desktop computing power anywhere! Your ZEOS notebook has many features of obvious importance. Also, there are a number of features that are subtle yet critical to your ultimate satisfaction. We'll go over them here one by one. We think you'll agree your new ZEOS Notebook is the one for you!

SYSTEMS STATUS AT A GLANCE: Yes, monitor eight key system components at a glance! We've equipped your new notebook with eight LED indicators which monitor disk access, keyboard functions and power status. There is even an audible alarm which may be programmed to inform you of a low battery condition and to let you know if the cover is closed with the power on. Now that's one smart notebook!

DESKTOP KEYBOARD FEATURES: We're talking 82 full size keys with full 101-key emulation. And the keyboard isn't squeezed either. The distance between the "Q" key and the "[" (left bracket) key measures 7.5 inches, just as PC Magazine suggests. The keys are of standard size, plus touch typists will love our full 3.5mm keystroke. Type for hours and love it!

CONNECTIVITY AND I/O: Keeping in touch is easy when you order our internal 2400 baud MNP Class 5 modem. Simply plug in the phone line and dial away. How about I/O ports? Many notebooks don't have them and if they do they're often non-standard. But your ZEOS notebook has *industry standard I/O*—serial, parallel and VGA. Just like your desktop!

FCC & UL APPROVALS: Your new ZEOS notebook features both FCC Class B and UL approvals. We've also met CSA and VDE requirements too, just for good measure. Quality and reliability.

WATCH THE DETAILS TOO: Like memory expandability. One Meg comes standard, you can also order a total of 3 or 5MB as a factory option. And lots of other details. Like a recessed power-on reset button, a soft carrying handle, built in speaker and more. You're going to love it! And there's no reason to wait.

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10 Good Reasons To Buy From ZEOS®

24 HOURS!
ZEOS is Open
24 Hours a Day,
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Reason #1
"Overall Excellence."

As *PC Magazine* said "Price is always a consideration. So are benchmark test results. But both factors can be deceiving, which is why we consider them in the context of other aspects that will make the difference months and years down the road."

These are the attributes which *PC Magazine* used in awarding ZEOS the coveted Editor's Choice, not once but four times. And "Overall Excellence" are the very words *PC Magazine* used in describing ZEOS systems comparing them to all others.

Reason #2
Dazzling Performance.

In one recent '386 review, *PC Magazine* awarded ZEOS Editor's Choice. "The ZEOS '386 blows away every other computer... a smart choice" is what they said. And in another recent review, *Government Computer News* said the ZEOS 33MHz '386 is "arguably the fastest MS-DOS and OS/2 micro in the world."

Dazzling Performance is built into every ZEOS system. It's a key component of ZEOS Overall Excellence.

Reason #3
Exceptional Quality.

PC Resource Magazine put it this way, "ZEOS... provides quality comparable with IBM or Compaq and does so for about 70% of the price." ZEOS uses only the very best components. And every system is fully tested and burned-in right in our own labs.

Reason #4
Value.

InfoWorld says, "We find the ZEOS '386 an excellent value. Speed: Excellent. Compatibility: Excellent. Value: Excellent." *Personal Computing* said, "ZEOS...is the best value we've come across...its performance is right up there with the slickest, most expensive PCs you can buy."

Reason #5
Warranties and Guarantees.

ZEOS believes in its products. That's why we offer each and every customer our 30 Day Absolute Satisfaction Money Back Guarantee, no questions asked. Plus, our One Full Year Limited Warranty and Express Parts Replacement Policy. Optional On Site Service is available too. Call for details.

Reason #6
24 Hour Toll Free Technical and Sales Support.

At ZEOS, the customer is #1. That's why we invented 24 Hour a Day Tech Support. For *your* convenience. If you buy a product from us we feel we should be there to help, any time of the day or night. Give us a call Toll Free! 800-423-5891. Anytime!

Reason #7
Experience.

Almost unique in the mail order computer industry, ZEOS maintains its own chip level Research and Development staff. In addition to Systems Manufacturing, we also operate our own Board Level Manufacturing facility.

ZEOS has been involved in Research and Development since our incorporation back in 1981. Our strong and experienced Research, Manufacturing and Technical Staff translates into superior factory direct computer systems for you.

Reason #8
A Sterling Reputation.

In magazine after magazine and review after review ZEOS systems are cited for Overall Excellence, for Excellent Value, as the Right Choice and so on. All of this is flattering but the most important thing is this: What do our customers think? Frankly, they love us. The systems and the support. That means more to us than anything.

Reason #9
Easy to Buy.

ZEOS systems are easy to buy. You can pick up the phone any time of the day or night and order your new ZEOS computer. And we accept MasterCard, Visa, American Express, and Corporate Purchase Orders from Fortune 1000 Companies, Colleges, Universities and Governments. Complete Leasing Programs are available as well.

And now the Z•CARD! It's your very own ZEOS Credit Card and you can apply today. With the Z•CARD you can charge your ZEOS purchases and pay in easy monthly installments. It's just like a Bank Card. Why not apply for your Z•CARD now!

Reason #10
You're Going to be Very Satisfied.

When it comes right down to it, you're going to be very satisfied with your new ZEOS system. Our goal is your complete satisfaction. And that's our commitment to you. To quality. To performance. To reliability and support. To *Value*. We don't just say it, *we Guarantee it!*

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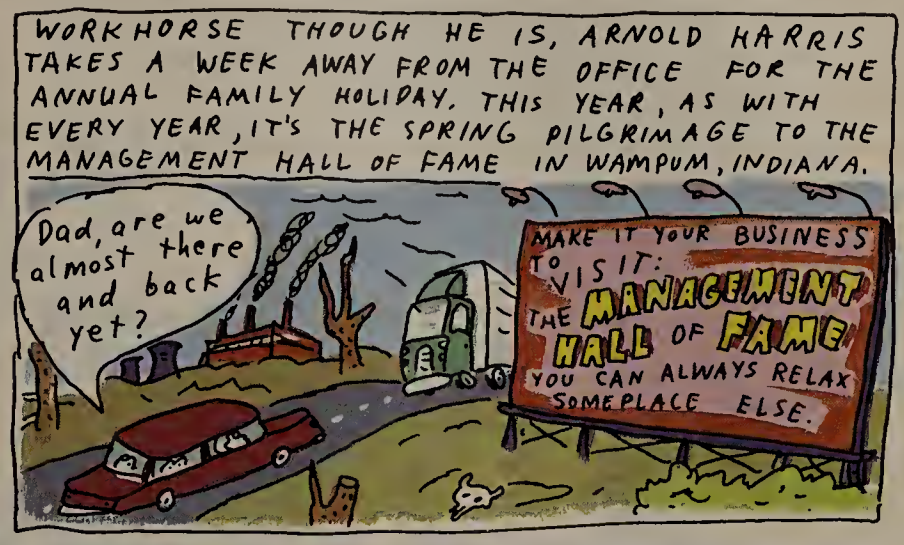
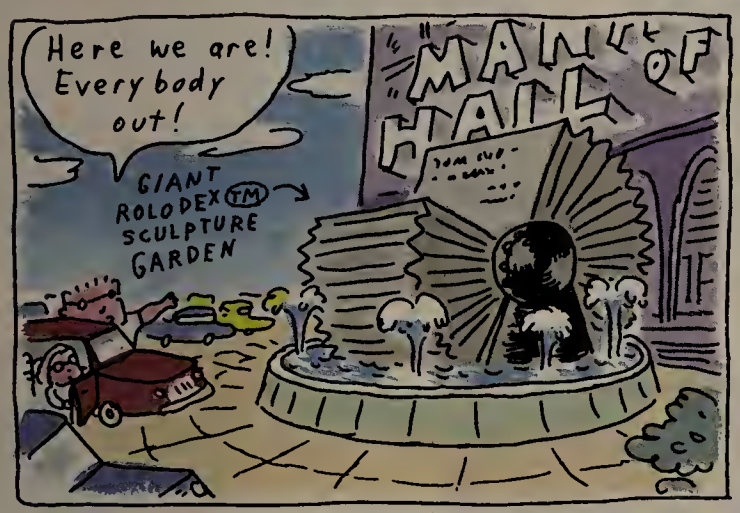
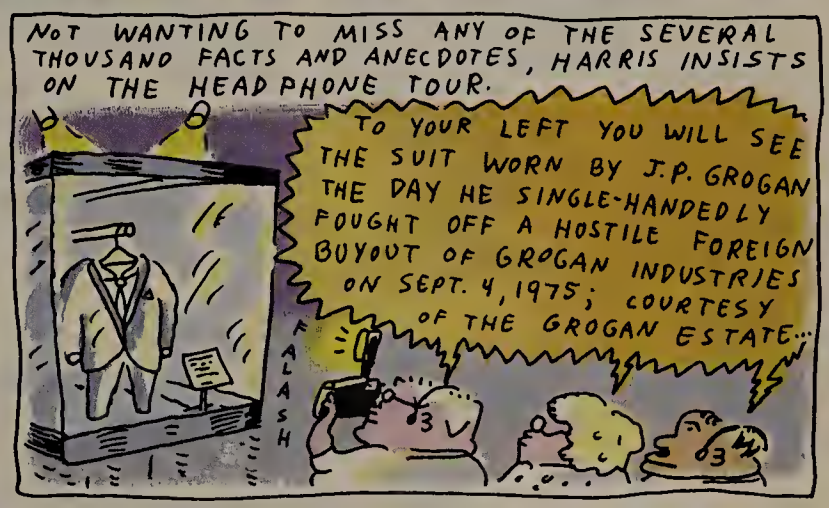
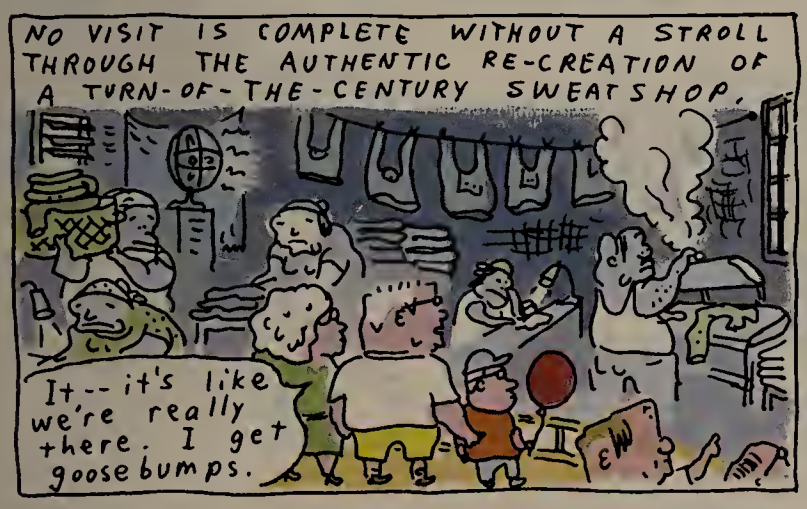
TWO-FISTED MANAGEMENT









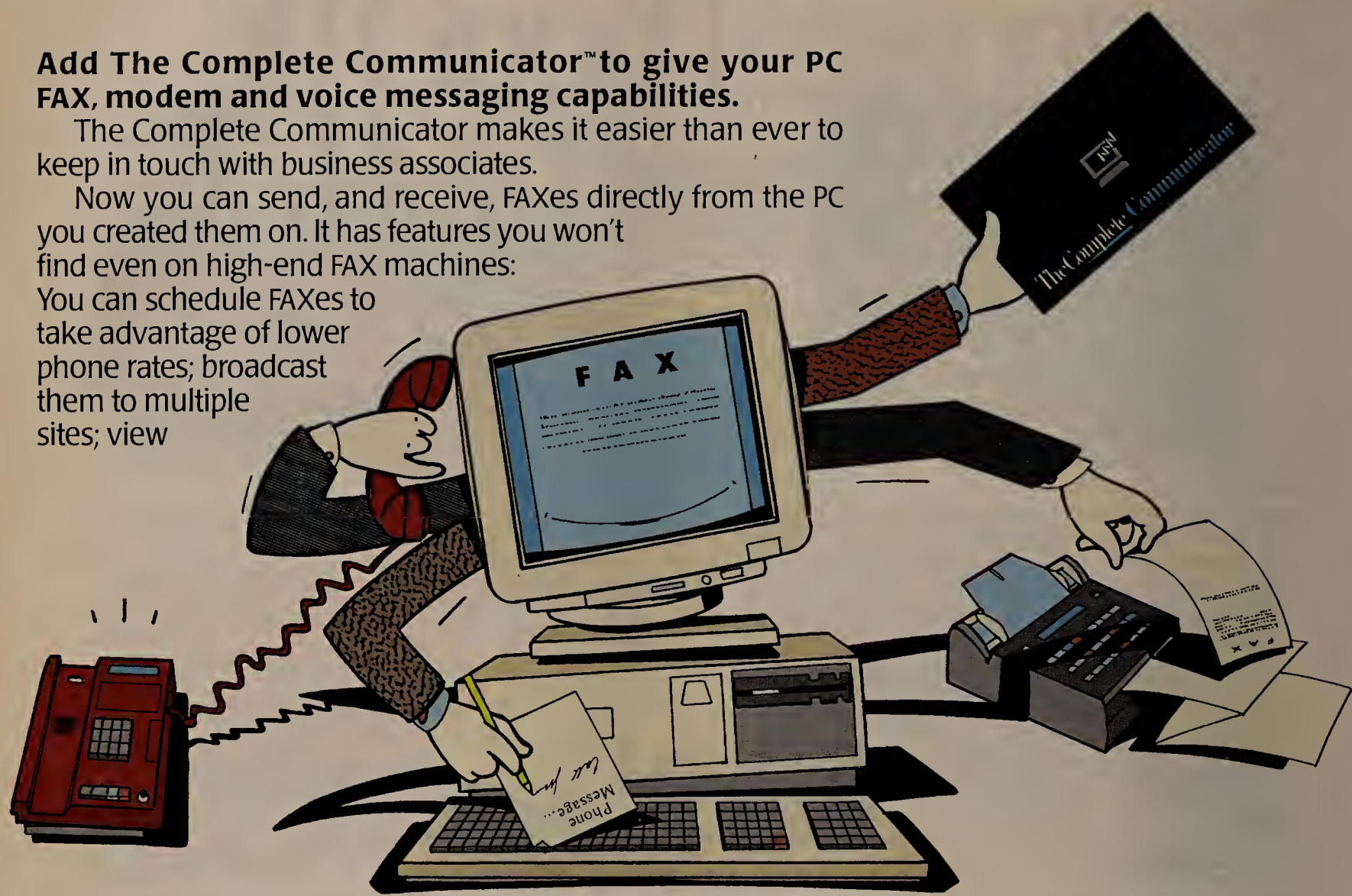
MARK MAREK

How To Teach Your PC New Tricks.

Add The Complete Communicator™ to give your PC FAX, modem and voice messaging capabilities.

The Complete Communicator makes it easier than ever to keep in touch with business associates.

Now you can send, and receive, FAXes directly from the PC you created them on. It has features you won't find even on high-end FAX machines: You can schedule FAXes to take advantage of lower phone rates; broadcast them to multiple sites; view



incoming FAXes on screen; print them out on plain paper; even forward incoming messages to a nearby FAX machine when you're on the road.

The Complete Communicator makes it easy to present a professional image to customers. It plays your personalized greetings on up to 999 password protected mailboxes; lets you retrieve messages remotely; and can automatically transfer calls and forward messages.

When you want to share data or access on-line databases and services, the built-in Hayes compatible modem does it quickly and easily using all the leading communications packages.

There's even a port to add The Complete Page Scanner,™ the easy way to add and store images.

With all these features on one easy-to-install board, it's amazing how many new tricks your PC can learn.

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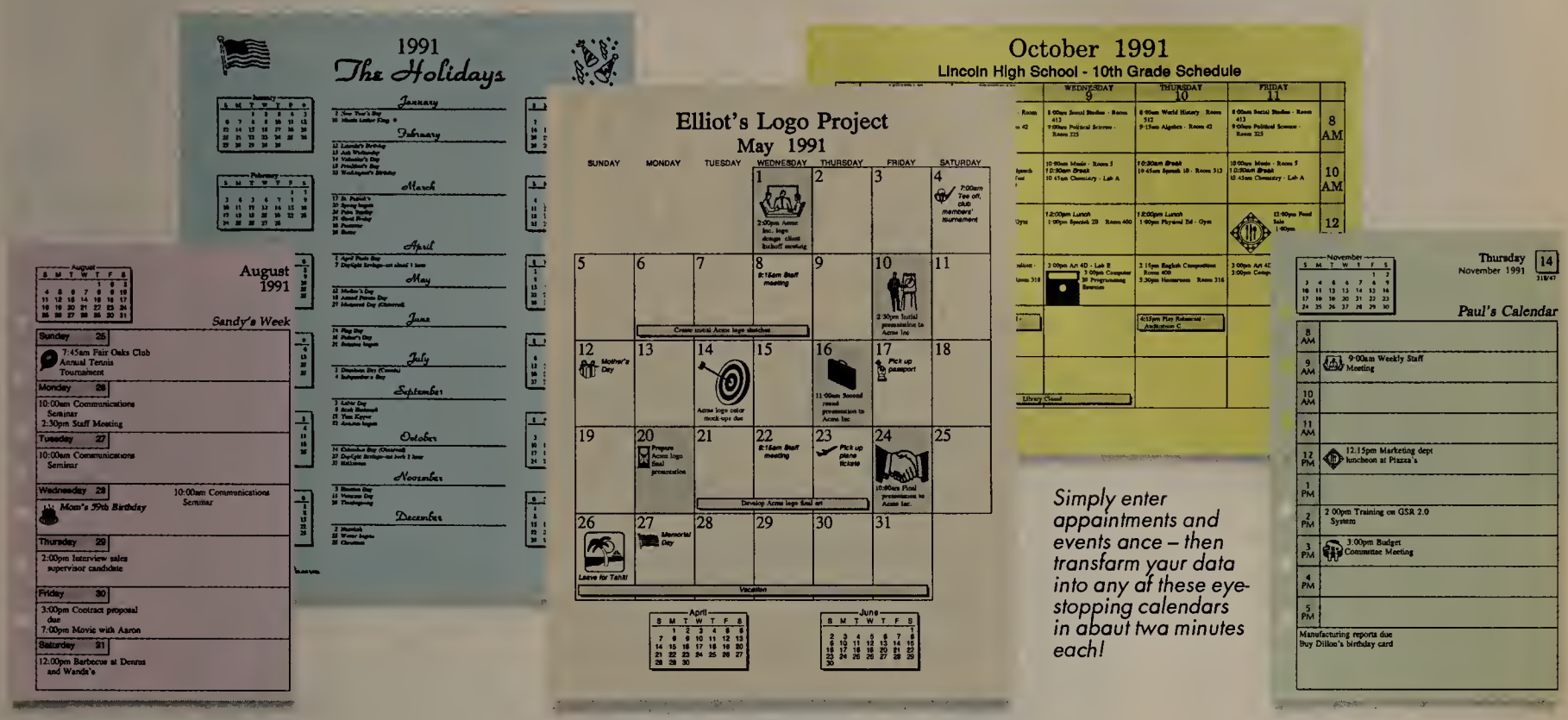

Simply enter appointments and events once – then transform your data into any of these eye-stopping calendars in about two minutes each!

Great-looking calendars are just minutes away!

Just enter your data once – then with the press of a key create impressive calendars in a variety of formats! New Calendar Creator Plus™ 4.0 gives you a choice of daily, two-day, weekly, two-week, monthly, six-week, quarterly, six-month, and annual calendars. You can even print calendars to fit popular organizers like Day-Timer® and Day Runner® – automatically!

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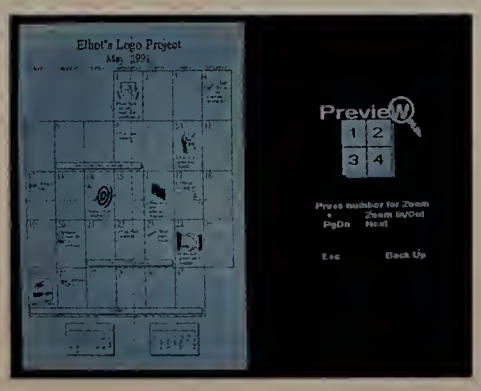
Two instantly scalable fonts are at your fingertips – or you can use other popular fonts. Add drop-shadowed bars for events that span several days. For emphasis, choose from over 75 supplied clip art images or use other clip art. You can even scan in images like your company logo. Calendar Creator Plus drives your laser or dot matrix printer to its maximum resolution.



Enter information once – then view it instantly in any of nine calendar formats. Add eye-stopping fonts and graphics...then preview your calendar in WYSIWYG before printing.

Manage schedules effortlessly.

Say your department has regularly scheduled Monday meetings. Instead of manually entering that information every week, just input it once and the meetings will automatically appear on your calendars. Or set up "floating" events like club luncheons the last Friday of every month. Create several calendars for different people or events, then merge them together into master schedules.

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Power Up!

Circle 211 on reader service card

PerFORM PRO FOR FORMS THAT FOLLOW FUNCTIONS

You use forms to capture and communicate information. You own PCs for the same reason. So why aren't your forms computerized?

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PerFORM PRO lets you implement a complete forms management system immediately.

Or you can start with just the basics, using tools created specifically for form designing. Then expand to electronic form filling when you're ready.

You can add complementary Delrina products. Soon, you'll be able to automatically turn paper forms into PerFORM forms. Right now, you can use WinFax to fax completed forms directly from any Windows application.

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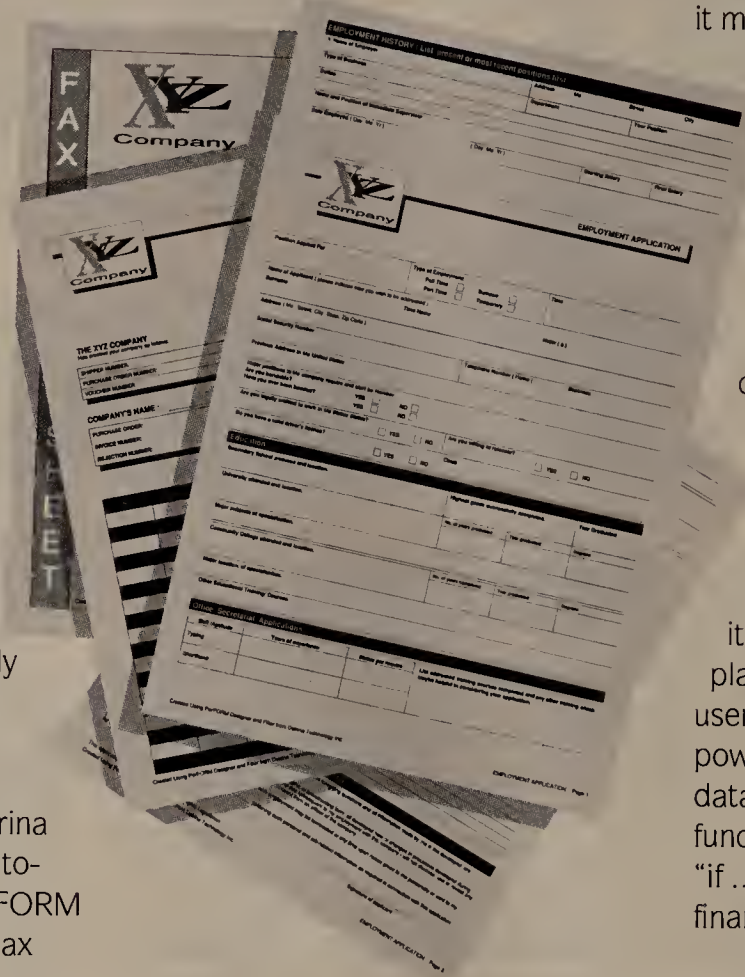
PerFORM Pro's WYSIWYG "Designer" software runs under Windows 3.0. And it makes form designing easier and more complete than any of the old ways. You'll find an array of tools. A wide choice of typefaces. Over 100 sample forms. And the ability to add graphics like your company's logo. For security, PerFORM PRO's powerful electronic signatures can secure data. And the final form design can also be locked.



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IBM Notebook Worth the Wait

What weighs less than ten pounds, runs 386-specific software at 20 MHz, and comes with 2MB of RAM, a 60MB hard disk, and the world's best notebook keyboard?

IBM's new 20-MHz PS/2 Model L40 SX notebook comes with an external keypad—standard.

ROBERT CARDIN

Michael Goodwin

He who laughs last, laughs best. IBM has been slow coming to market with a notebook PC, but now that the PS/2 Model L40 SX is here, it's clear that the company hasn't been twiddling its Big Blue thumbs. While this system is a bit on the heavy side, it looks like a real winner. And the pricing is reasonable—at least compared to Compaq's and Texas Instruments'.

The Model L40 SX is designed to work flat out, full-time, with no compromises and no cut corners. Its 20-MHz CPU will speed through even big *Windows* applications. Its standard 60MB hard disk is large enough to hold all the programs, worksheets, and graphics files you're likely to need. And its 18MB of installable RAM (you decide how much is extended and how much is expanded) means you can load all the memory you (or *Windows*) will ever require.

Its keyboard is the finest we've seen on a notebook—or on a full-sized laptop, for that matter. There are *no* emulated keys. You get a fully standard PS/2 layout: Cursor keys (in the familiar inverted T), page keys, control keys, and 12 function keys are all dedicated and all located right where your fingers expect to find them. The touch is terrific, and you can even turn the key click on or off.

Do you enter a lot of numerical data? Then you've got one more reason to like the L40 SX: A 17-key external keypad comes standard with the system. Do you use a mouse? Then you'll be pleased to learn there are two PS/2 mouse ports, one at the rear of the machine and the other on the keypad.

Small, but Not That Small

All these features take steel and plastic. And in a genre where some machines tip the scales at 6 pounds traveling weight (that's PC, battery, AC charger, and power cable), IBM's 9.7-pound notebook is far from the lightest.

Nor at 2.1 by 12.8 by 10.7 inches is it particularly small. In fact, this 288-cubic-inch machine is bigger than any of the systems reviewed in "386SX Notebooks: Portable Powerhouses" in this issue. Of

(continues)

SNAPSHOT

IBM PS/2 Model L40 SX

IBM's 9.7-pound, 20-MHz SX notebook arrives with an impeccable PS/2 keyboard, four batteries, and a 60MB hard disk.

KEY FEATURES

- **2MB RAM standard, expandable to 18MB**
- **10-inch VGA screen with 64 shades of gray**
- **Two PS/2 mouse ports**
- **17-key external keypad**

AVAILABILITY

Immediate

PRICING

With 2MB RAM $5995; with 4MB RAM, fax modem, DOS 4.0 $6968

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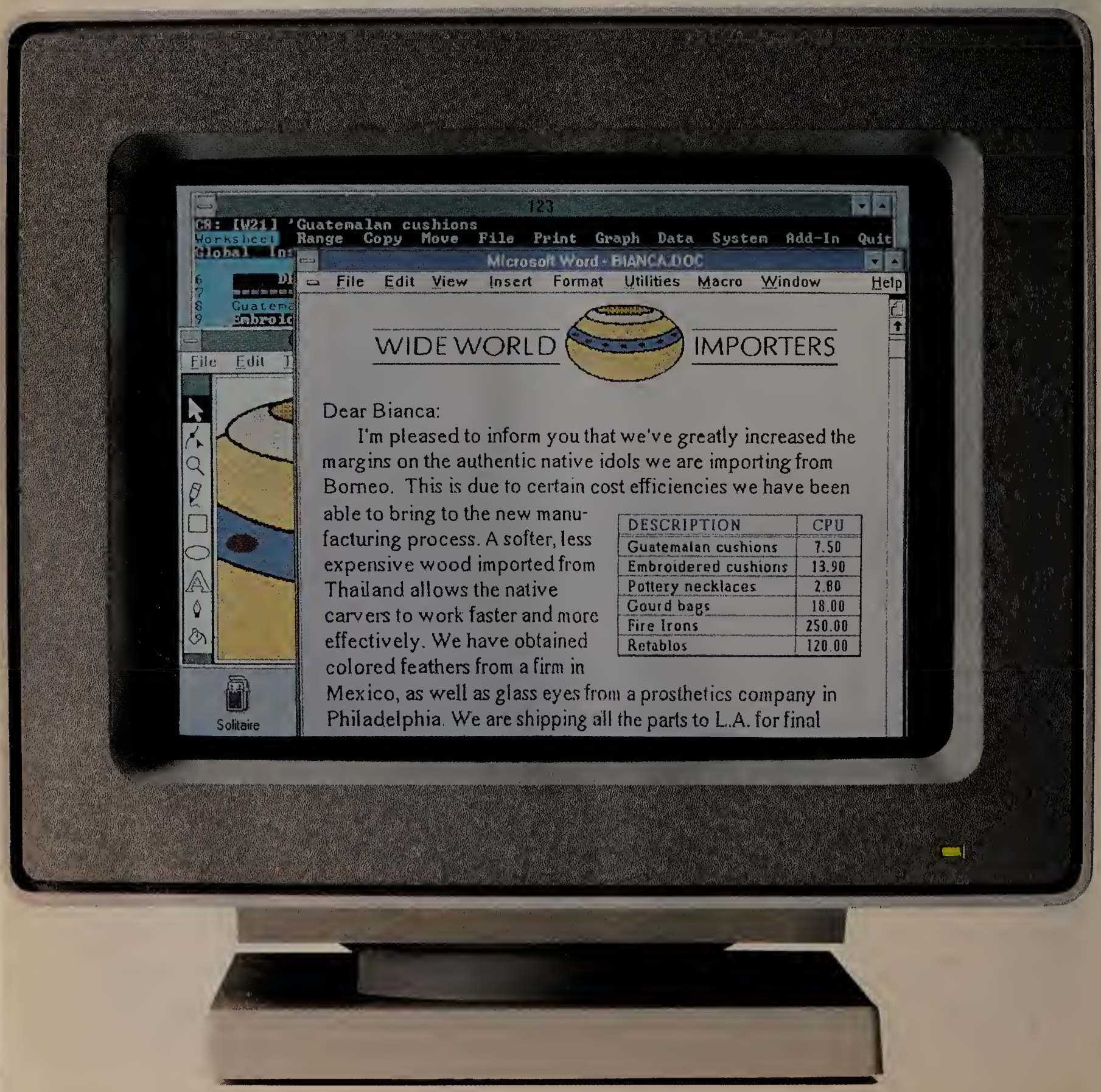

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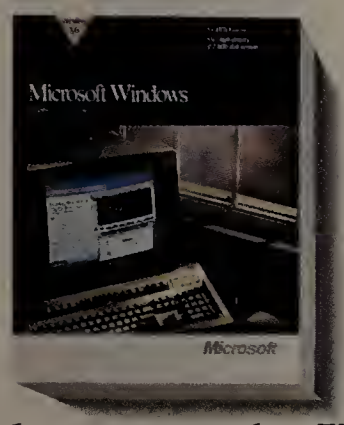

The Microsoft® Windows™ graphical environment version 3.0 makes it easy for you to do a lot more with your PC. That's because the Windows environment has friendly icons, menus and dialog boxes that make its powerful features very accessible.

Windows lets you work with a variety of applications on-screen at the same time. Including your character-based programs.

But it's when you start using Windows applications that you get the most out of your PC. Windows applications are easy. In addition they all work essentially the same way. So once you learn how to use one, you generally know how to use them all.

And they're so intuitive that experimenting with them is fun.

Windows applications let you cut and paste text and graphics. And let you combine them right on your screen. They also let you print out exactly what you see.

You can even establish links between Windows applications. Which means, if you change any numbers in Microsoft Excel for Windows, the chart you cut and pasted into your Microsoft Word for Windows document will be automatically updated.

So call us at (800) 541-1261, Department P32, to find out more about Windows, Windows applications or the big Windows World Convention and Exposition coming up May 20th and 23rd in Atlanta.

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The keyboard (top) has dedicated cursor, page, function, and other control keys right where you expect them. Status icons (bottom) keep you informed of everything from disk activity to humidity.

ROBERT CARDIN

course, if three years ago someone had offered you a 20-MHz, VGA-equipped, hard disk laptop that weighed only ten pounds, you'd have expected a proffer of the Brooklyn Bridge to follow closely.

Batteries: Bad News, Good News

Another concern for travelers: Neither battery life nor recharge time is particularly impressive. IBM claims "a maximum" battery life of 3 hours. Presumably, that means 3 hours with the benefit of inconvenient, power-saving features like hard disk time-out. If you hate waiting for the hard disk to power up every time you need to read in another data file, you'll probably turn off the power-saving features—and battery life will drop accordingly.

IBM reports an *extremely* slow 8-hour recharge time with the standard AC charger; some machines we've tested do the job in 1 hour. If you use the optional quick-charger, you can expect a full recharge to take 2.5 hours—still not very fast.

On the bright side of the battery issue, the Model L40 SX comes standard with two rechargeable batteries; exchanging them is easy, so under normal circumstances you can expect to keep working for up to 6 hours away from the power plug. A built-in standby battery keeps the system running while you change batteries. And a helpful LED power gauge located just below the screen gives you a constant readout of how much battery time is left.

Big-Screen Success

The display is a crisp, high-contrast, monochrome VGA unit with up to 64 shades of gray (depending on the VGA mode you're using). The more gray shades a notebook can deliver, the more capably it can render color applications into readable black, white, and gray versions. The display measures 10 inches diagonally—one of the largest screens you can get. Fluorescent sidelighting makes text and graphics stand out nicely, and you can adjust contrast and brightness with two handy sliders on the side of the screen.

Just below the screen, a row of slick-looking system status icons keeps you advised about keyboard mode (Caps Lock, Num Lock), fax modem operations, floppy and hard disk activity, and temperature and humidity conditions that preclude safe operation. The system is designed to run in temperatures between 41 and 95 degrees Fahrenheit, although floppy disk access below 50 degrees is not recommended.

Extra Touches

IBM's engineers have devoted a good deal of attention to ergonomics, which means a lot if you expect to be using your Model L40 SX every day. For one thing, the external power jack (which you're likely to need often) is fully accessible, not hidden behind a nail-breaking hatch cover as is so often the case. There *are* three hatch covers on the back of the notebook, but they all operate smoothly and easily. They cover the mouse port, serial and parallel ports, the battery, connectors for an external VGA color monitor, and an AT-bus connector that may attach, someday, to a docking station.

While that docking station has not even been promised officially, several neat options are available now. A 2400-bps fax modem and the quick charger are for sale immediately. A Trackpoint option that aims to combine the convenience of a mouse and a trackball in a single device will be available "soon."

There are also plenty of tempting standard "extras," like a leather case, power-on password protection, and a "server" mode that allows the system to be turned on so other users can access the hard disk while the keyboard remains locked.

You can run all the setup options from a menu-driven utility—or you can use one of three batch files that automatically configure the system for travel (with all power-saving features enabled), for office use, and for printing. The Model L40 SX comes with a one-year warranty, and an on-site service option is available through your local IBM dealer for $95 a year.

While the Model L40 SX comes in at half the weight of earlier PS/2 portables, a glance at its notebook competitors shows IBM is still emphasizing power first and portability second. And rivals like Tandon's NB/386sx will take a noticeably smaller bite out of your checkbook. But a solid design and thoughtful touches make this the first Big Blue machine that most of us really would take on the road.

Michael Goodwin is an associate editor for PC World.

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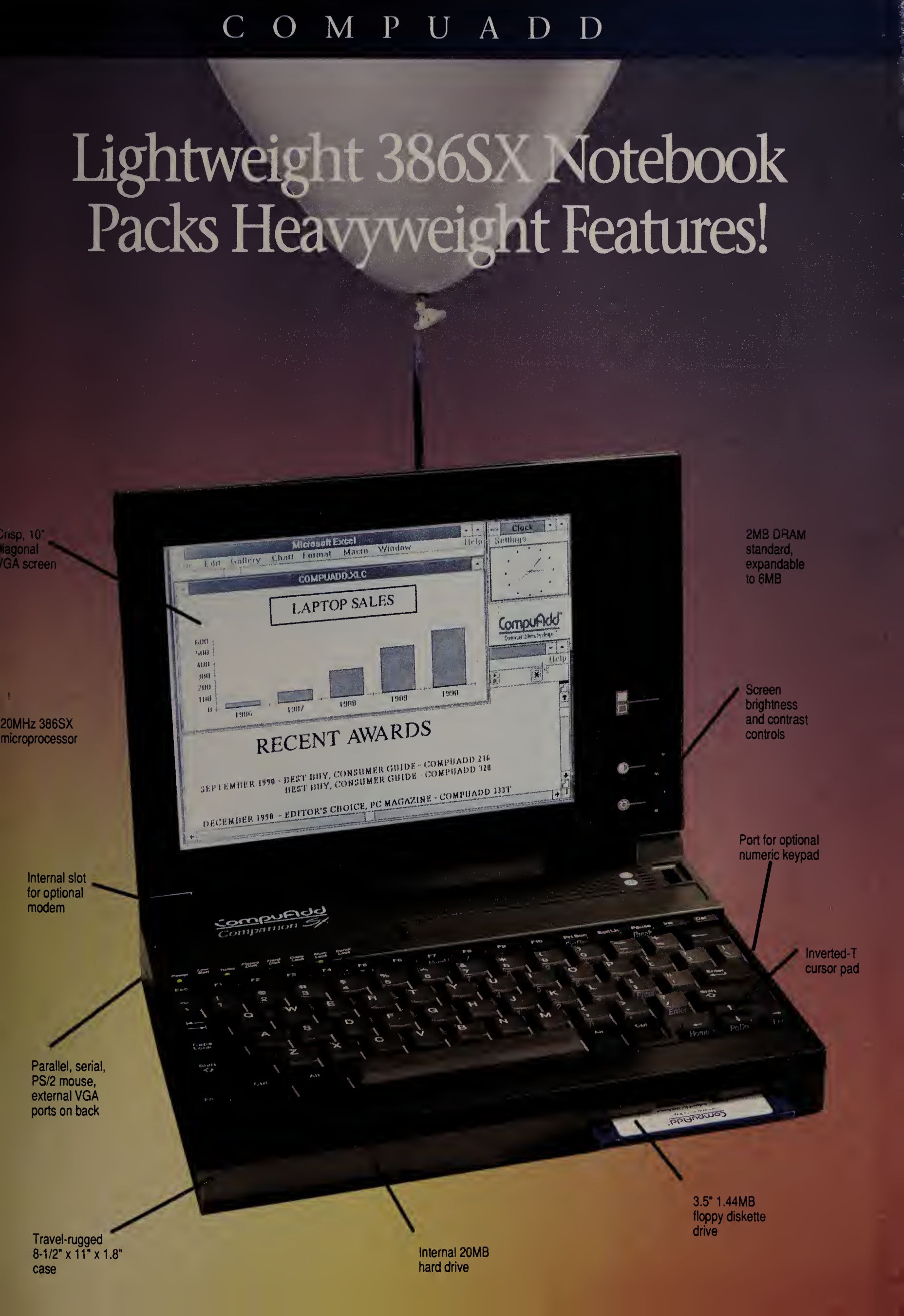

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Add on the optional numeric keypad for quick data entry.

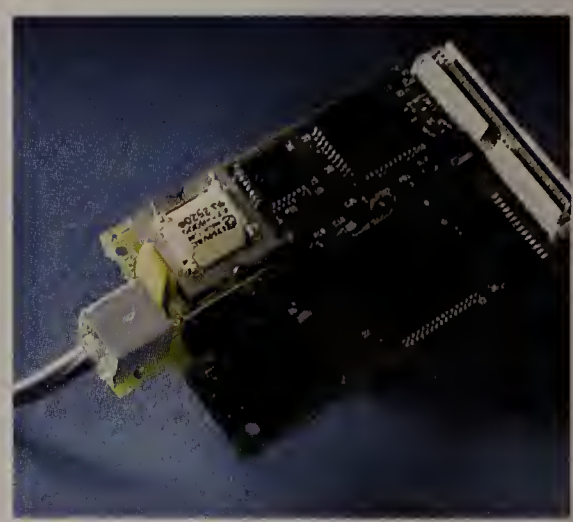
The NEW CompuAdd CompanionSX continues the CompuAdd tradition of bringing you the latest PC technology plus all the famous CompuAdd extras! Powered by the Intel™ 20MHz 386SX microprocessor, the CompuAdd CompanionSX puts 32-bit processing power in a package less than two inches thick and only 5.7 pounds — almost *two pounds lighter* than the Compaq LTE 386s/20!

Packed with features you expect on a 386 desktop computer, this 8-1/2" x 11" notebook powerhouse sports a 20MB hard drive *and* a 1.44MB 3.5" floppy diskette drive! Plus you can expand the standard 2MB DRAM to 6MB.

Now you can run all your favorite Windows applications on the road with the power of a desktop 386SX. Plus you get the security and convenience of a computer that stows in your briefcase — with plenty of room to spare!

CompuAdd extras include and FREE CompuAdd MS-DOS 4.01 *($89 value)* preloaded on the hard drive! Add in CompuAdd's award-winning customer service, and you have a system that travels light but works like a heavyweight!

This notebook-sized wonder gives you a 10" diagonal, mono VGA sidelit LCD screen that's crisp and legible in a variety of lighting conditions. And the built-in CRT Interface lets you hook up your full-sized color VGA monitor for desktop use.


Add an optional modem to keep in touch on the road.

The CompuAdd CompanionSX features a 79-key keyboard with separate cursor movement keys arranged in the inverted-T preferred on desktop keyboards. The keyboard has the feel of your desktop keyboard, with solid tactile response and plenty of room between keys.

You can add capability to your CompuAdd CompanionSX as your needs require. Plug in an optional numeric keypad or add an optional internal modem to keep in touch when you're on the road.

Standard I/O ports make peripheral hook-up easy.

The CompuAdd CompanionSX provides standard I/O ports — parallel, serial, PS/2 mouse and external VGA monitor — behind a convenient hinged door.

Carry the power of a 386SX anywhere! Call now and get an unbeatable portable — the CompuAdd CompanionSX notebook PC!

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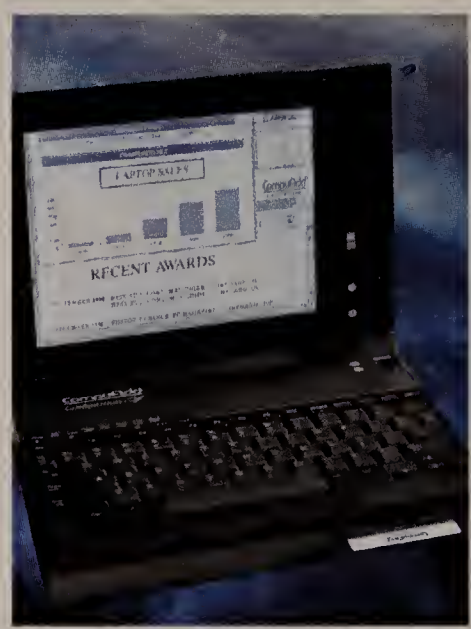
The NEW CompuAdd CompanionSX notebook continues the CompuAdd tradition of bringing you the latest technology at incredible savings! The CompuAdd CompanionSX is incredibly light and compact — only 5.7 pounds and 8-1/2" x 11" x 1.8". Yet it packs all the power of a desktop 386SX computer!



Equipped with a 20MB hard drive and a 3.5" 1.44MB diskette drive, the CompuAdd CompanionSX fits securely and discreetly in your briefcase with room to spare. You get the same functionality and software capability you have with a desktop computer, plus options that enable you to plug into your office network, send fax documents, download data from remote computers and send error-free file transfers. All this plus a crisp, 10" VGA display!

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CompuAdd also offers portable printers, projectors and data displays to make your 320SL a complete office on the road! Check out the savings when you buy CompuAdd's 320SL Kit with Diconix printer and modem/send-only fax.

CompuAdd CompanionSX Features

- 80386SX microprocessor running at 20MHz
- Standard 2MB DRAM expandable to 6MB
- Built-in serial, parallel printer, numeric keypad, PS/2 mouse and external VGA ports
- Crisp, high-resolution 640x480 mono VGA display
- 20MB hard disk drive with 23ms access speed
- 79-key keyboard with 101-key emulation, 12 function keys
- *FREE!* CompuAdd MS-DOS 4.01 *$89 value*
- Rechargeable/removeable internal battery pack
- Modular AC adapter
- Dimensions: 8.5" x 11" x 1.8"

System Price: $3595 *(62301)*

CompuAdd 320SL Laptop

- 386SX microprocessor running at 20MHz
- Standard 2MB high-speed dynamic RAM expandable to 6MB
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- High-resolution 640x480 monoVGA display with 8.75" diagonal sidelit, supertwist LCD screen
- 3.5" 1.44MB high-density diskette drive
- 40MB hard disk drive with 28ms access speed *(call for optional 100MB drive prices)*
- 85-key keyboard with 101-key emulation, 12 function keys and four cursor keys
- *FREE!* CompuAdd MS-DOS 4.01 preloaded *$89 value*
- *FREE!* Carrying case *$49 value*

System Price: $2895 *(62205)*
Kit Price: $3349 *(62208)*

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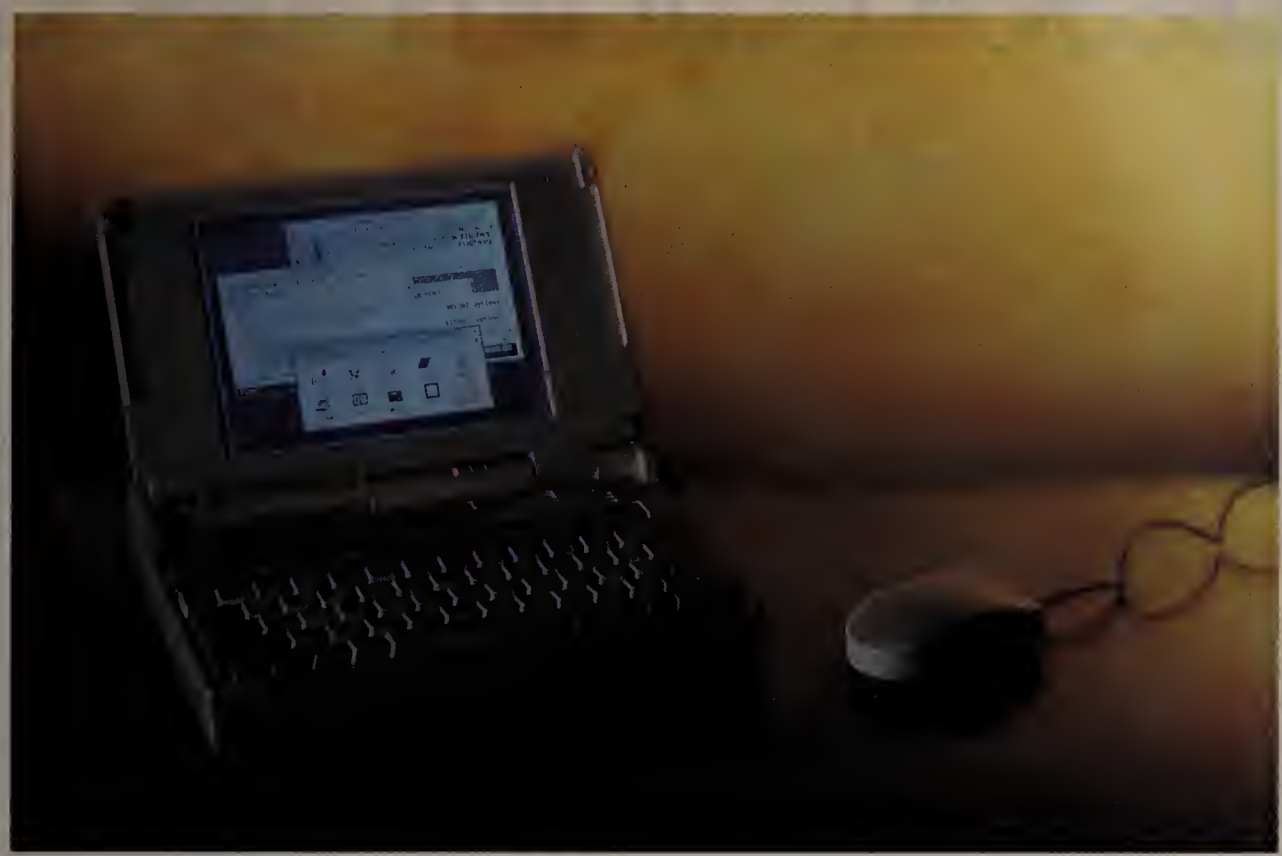
Tandon Clones Laptop Winner

Tandon rolls out a Compaq challenger with a few more features for a lot fewer dollars.



The NB/386sx brings you all the features of the best-selling Compaq LTE 386s/20—20-MHz power, VGA graphics, and a notebook footprint—but for thousands less.

ROSE HODGES

Mike Hogan

Even if it weren't the only 386SX notebook PC shipping in quantity in early 1991, Compaq's got-everything/do-everything LTE 386s/20 still would be the standard by which other notebooks were measured. But of course, this exalted status makes it a sitting duck for everything that comes after.

In mid-March Tandon rolled out its NB/386sx with a full set of features, aiming to knock the LTE off its perch. Most striking is a list price $1000 to $3000 lower. But there's more than that to the NB/386sx.

Consider the NB/386sx a poor man's LTE. It offers the same buff-colored case with the same 8½-by-11-by-2-inch dimensions. You get the same 9-inch-diagonal, black-on-white VGA display with 16 shades of gray. In fact, the NB/386sx includes all the main ingredients of Compaq's no-compromises standard setter—20-MHz 386SX, 3½-inch floppy, and your choice of 30MB or 60MB Conner hard drive.

But the NB/386sx also has room for 16MB, rather than 10MB, of fast system-board memory. It weighs 6.5 pounds with battery compared to the LTE's 7.5 pounds, and Tandon even throws in a soft leather carrying case.

Price-Less

Then there's that huge disparity in price. The list on the NB/386sx's 30MB version is $3495—a little more than half Compaq's $6499. Of course, Tandon sells direct, while your retailer may sell you an LTE for as low as $4600.

The NB/386sx fits sideways into half your briefcase, although the 1.6-pound charger is bulky. The NB/386sx recharges very quickly—in about 2 hours—and the AC adapter overrides the automatic screen-blanking.

Hit the suspend button to put the NB/386sx to sleep when your computing is interrupted; resume where you left off minutes or days later. The battery gives you up to 3 hours between charges. An extra battery is both cheap ($59.95) and conveniently sized and shaped (like four D cells laid end to end).

The NB/386sx's full-travel keyboard feels as good as the LTE's, but that's not saying much. A small footprint forces the keys a little too close together, compared to those on slightly larger notebooks like the Toshiba T2000, and the <Cursor Up> key is squished in where your fingers expect to find the shift key.

Desktop Replacement

Compaq's notebook shines brighter in its expansion unit, which houses more slots and storage. The NB/386sx's unit is a simple box, housing a 62-watt power supply and four 16-bit slots—one taken by the adapter for the 100-pin connector. But the expansion unit still turns the NB/386sx into a desktop equivalent—for $299, rather than the $1499 the LTE's unit costs.

No, *Tandon* doesn't provide the same comfort level as *Compaq,* even though Tandon is a heavyweight in Europe with a balance sheet that would make any PC maker proud. But Tandon aims to break into the United States market big with the NB/386sx. Check out this machine before the supply runs out...or Tandon wises up.

Mike Hogan is a senior editor for PC World.

SNAPSHOT

Tandon NB/386sx

An artful combination of notebook power features, the NB/386sx comes with a very friendly price tag.

KEY FEATURES

- **6.5 pounds with battery, 8 pounds with AC adapter/charger**
- **2MB of RAM standard, expandable to 16MB**
- **$299 expansion unit with three open 16-bit slots**

AVAILABILITY

Immediate

PRICING

30MB unit $3495, 60MB unit $3995

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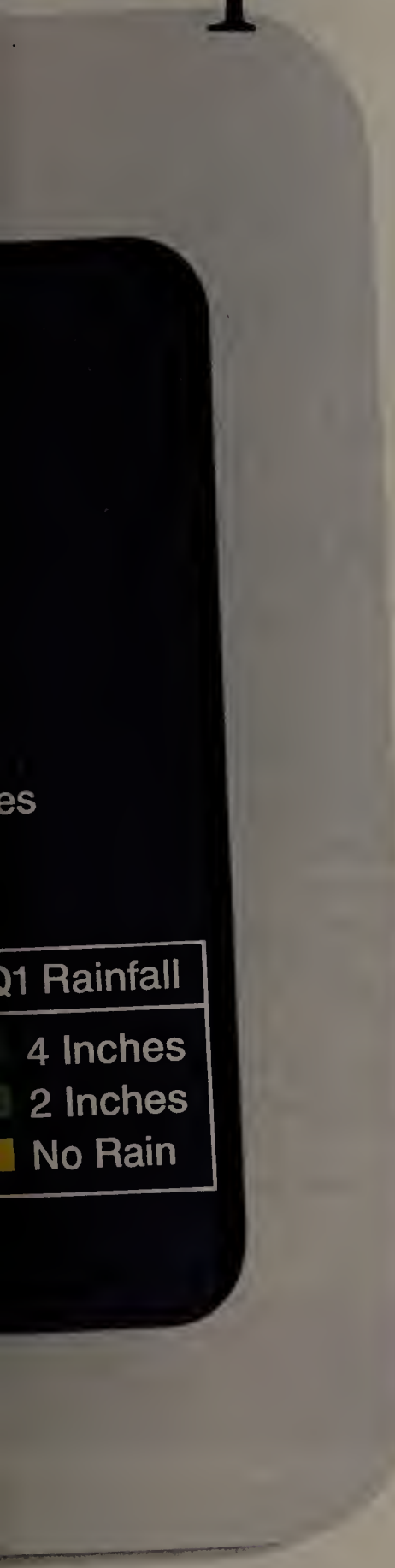

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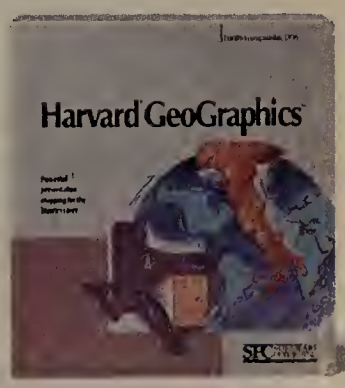
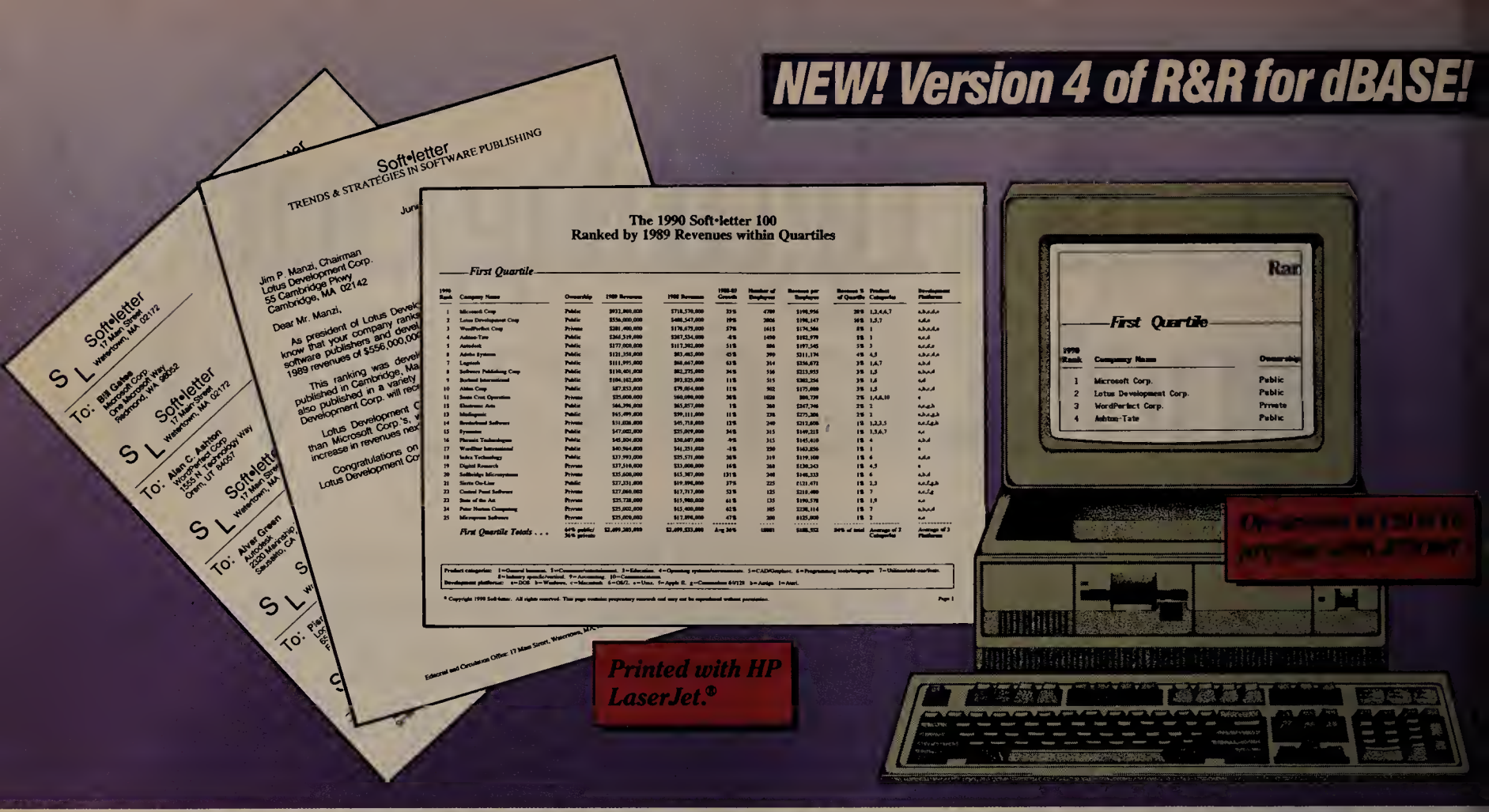
Maps you can then custom-define, like we did with our Tucson example. You can also have the program color-code each map automatically by just typing in your data. Or even link your map to a spreadsheet or database so it always reflects the latest and greatest information.

Call for your free demo disk today.

The technique is called mapping. But we think you'll call it just plain smart.



SPC SOFTWARE PUBLISHING CORPORATION



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- Use dBASE III,® III Plus,® IV,™ Clipper,® Quicksilver,® dBXL,® FoxBASE+,® FoxPro.™ Index support is built-in.

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PC World, ***July 1990***

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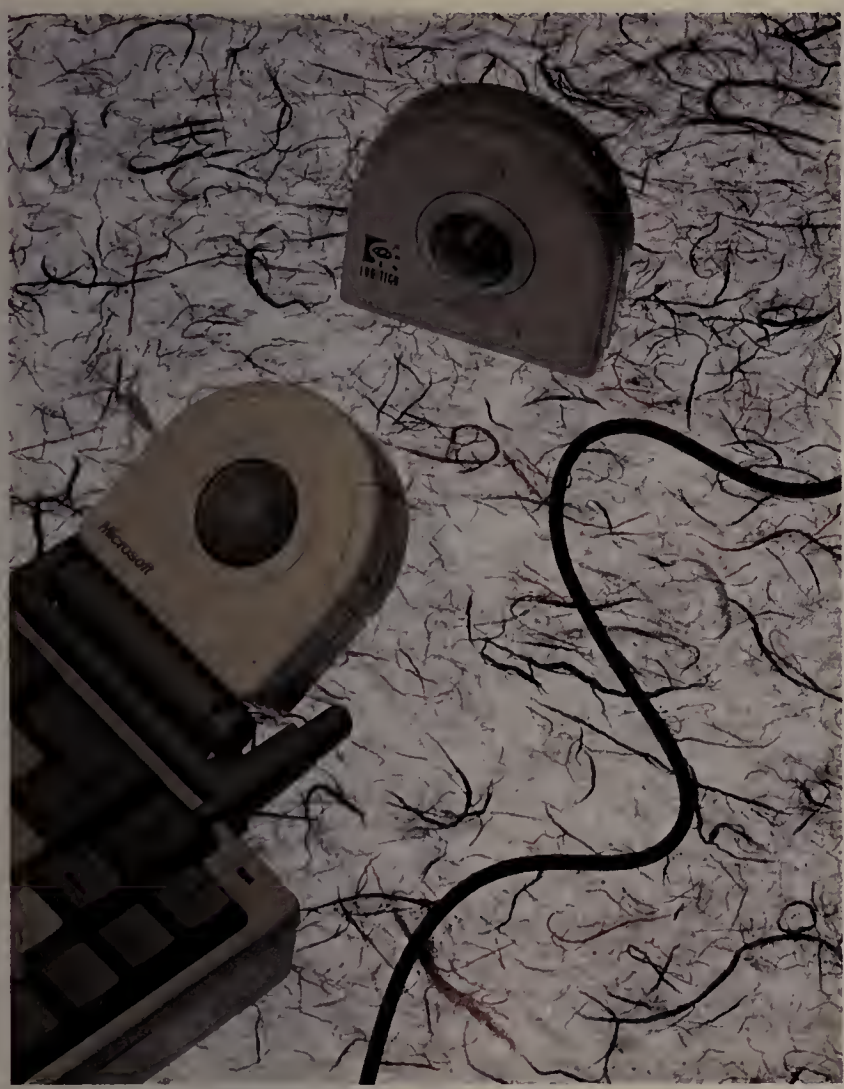
Circle 181 on reader service card

Mice on the Move

Microsoft's BallPoint Mouse and Logitech's TrackMan Portable aim to assist the traveling Windows user.



Microsoft's BallPoint clamps easily to the side of virtually any notebook. Logitech's TrackMan Portable, shown standing, works well with laptops and desktops.

ROSE HODGES

Susan Lusty

With more than four million users, the Microsoft Mouse is hugely popular—except when you take it on the road, where it and its kin can be a pain in the hand. (Ever try to run a *Windows* application with a laptop actually in your lap?)

As notebooks sell in ever-greater volume, mouse makers are heeding the call to create a new breed of mice-to-go. Microsoft and leading rival Logitech have done just that with Microsoft BallPoint Mouse and Logitech TrackMan Portable.

Both of these devices are trackballs—they're designed like an upside-down mouse with a ball in a socket; you move the ball with your fingers. They attach to any side of your portable with spring-loaded clamps (BallPoint's are exceptionally slick) and detach easily for desktop maneuvers. You adjust the clamps to tilt the mice for hand size and comfort.

BallPoint has two buttons on each side; you set them for right- or left-handedness via software. The device comes with a bundled 20-inch cable and 400-dot-per-inch (dpi) default resolution. You can adjust this via software in small increments from 14 to 1400 dpi. BallPoint plugs into 9-pin and PS/2 mouse ports.

TrackMan puts secondary buttons on the front and the main button on the side. You switch hand preference manually with the main button. A 24-inch cord sits in a canal underneath the mouse. Resolution defaults to 200 dpi, but it can be adjusted via software to between 50 and 15,000 dpi. TrackMan supports 9-pin and 25-pin serial ports and the PS/2 port interface.

Both devices are much smaller than a regular mouse or trackball; TrackMan is slightly larger at 2½ inches high and wide. Both are too big simply to mount on your notebook and forget about until needed, but each comes with a convenient carrying case.

Windows Wanderers

Both mice guarantee compatibility with the Microsoft Mouse, install easily, and support *Windows 3.0.*

BallPoint's *Compass* software includes the DOS Control Panel, which allows you to adjust sensitivity and acceleration, and another utility that lets you designate which buttons are primary and which are secondary, and enable or disable the drag-lock feature. The Windows Control Panel is the *Windows* equivalent.

TrackMan Portable's *MouseWare 6.0* includes the Mouse Control Center for *Windows* and a DOS version as well. *MouseWare* lets you set sensitivity, double-click speed, orientation, drag-lock option, and button functions. The software also creates menus so you can use a mouse with such leading DOS applications, as *1-2-3* and *WordPerfect.* Additionally, *MouseWare 6.0* includes an enhanced cursor that improves visibility for DOS applications on portables.

Both mice are well designed; you'll prefer whichever feels more comfortable to you. They come at a slight cost premium over standard models, and some die-hard mousers may never feel comfortable driving a trackball. But many others will be pleased with these two for the road.

Susan Lusty is an assistant editor for PC World.

SNAPSHOT

BallPoint Mouse and TrackMan Portable

Traveling companions for portable PCs double as desktop mice.

KEY FEATURES

- **Devices attach and detach from portable or desktop PC**
- **Convenient software controls for sensitivity, other parameters**
- **Support for Windows 3.0**
- **Compatibility with Microsoft Mouse**

AVAILABILITY

March for BallPoint Mouse, July for TrackMan Portable

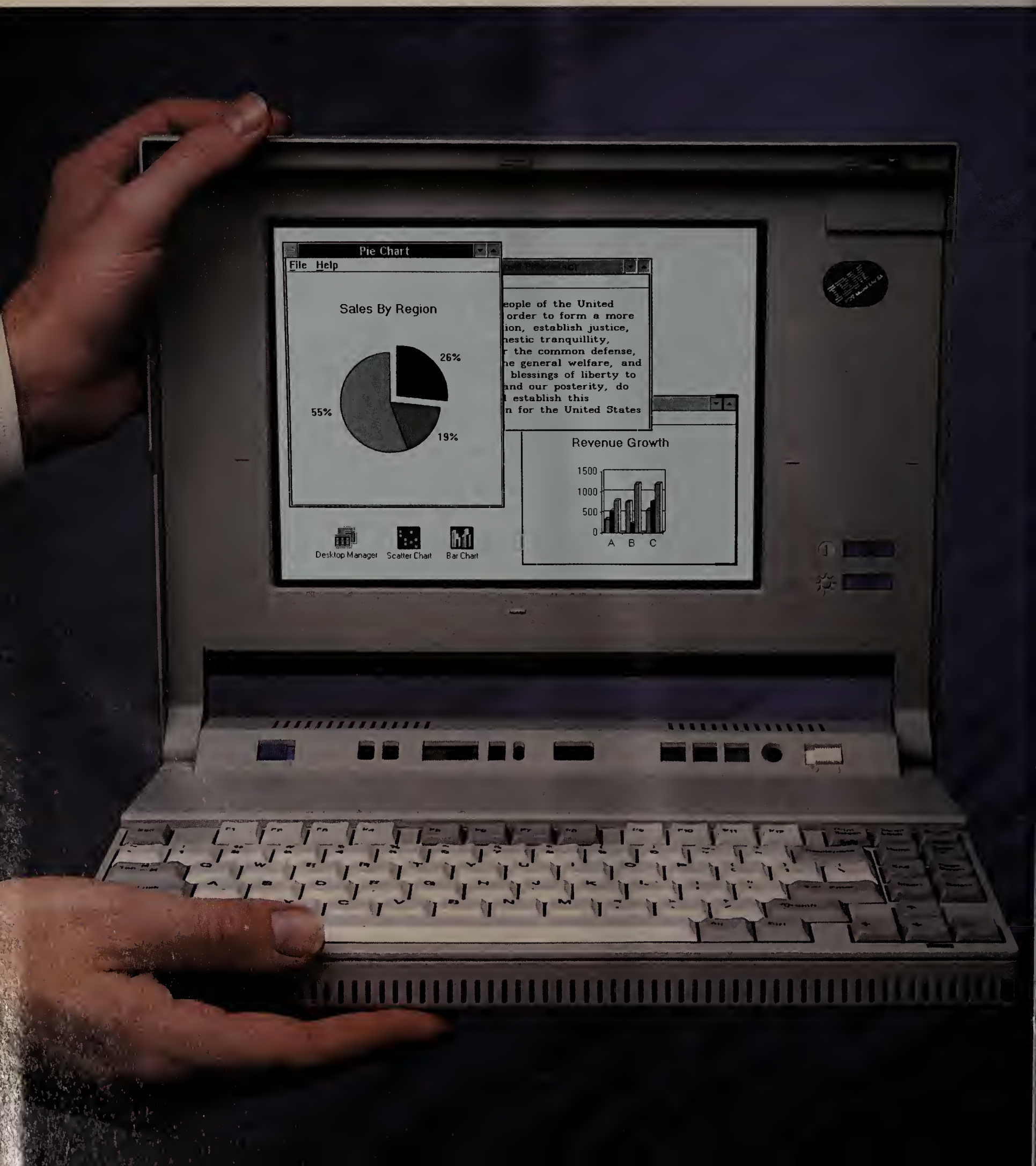
PRICING

BallPoint Mouse $175, TrackMan Portable $149

Microsoft Corp.
One Microsoft Way
Redmond, WA
98052-6399
800/426-9400,
206/882-8080
Reader service no. 686

Logitech, Inc.
6505 Kaiser Dr.
Fremont, CA 94555
800/231-7717,
415/795-8500
Reader service no. 687

The body of
The heart and



a laptop.
soul of a PS/2.

FEATURES	IBM PS/2 LAPTOP 40 SX
MICROPROCESSOR	
Standard	80386SX With Suspend/Resume
Clock Speed	20 MHz
MEMORY	
Standard	2MB
Maximum	18MB
STORAGE	
Standard Diskette Drive	3.5" 1.44MB Diskette Drive
Standard Hard Drive	2.5" 60MB Fixed Disk
PACKAGING	
Dimensions	2.1" (H) x 12.8" (W) x 10.7" (D)
Weight	7.7 Lbs. W/Battery
POWER	
Battery	Up to 3 Hours; W/ Non-Disruptive Exchange; W/ Battery Status Indicator
KEYBOARD	101 Keys (W/Numeric Keypad); 5 Degree Slant; Standard Key Spacing
DISPLAY	LCD/Sidelit; VGA/32 Gray Scale
OPTIONS	Data/Fax Modem; Trackpoint (Mouse/Track Ball); Quick Charger

Introducing A PS/2 Laptop That's Full Of Features. Not Compromises.

Making a computer light enough to take anywhere and small enough to sit on a lap isn't enough. Making it perform like one that sits on a desk is the true challenge. That's why IBM has created a computer that delivers true portability without sacrificing true performance—the Personal System/2® Laptop 40 SX. At just 7.7 pounds it's clearly a lightweight computer. But it certainly doesn't act like one.

Desktop Performance, Without The Desk.

The PS/2® Laptop looks great from the outside. But its true beauty lies inside, where you'll find uncompromised computing power. It has the same 386SX™/20 MHz processor found in best-selling desktop models. A 3.5″ 1.44MB disk drive and 2.5″ 60MB fixed disk provide fast access to programs and data, and standard 2MB RAM is expandable to 18MB.

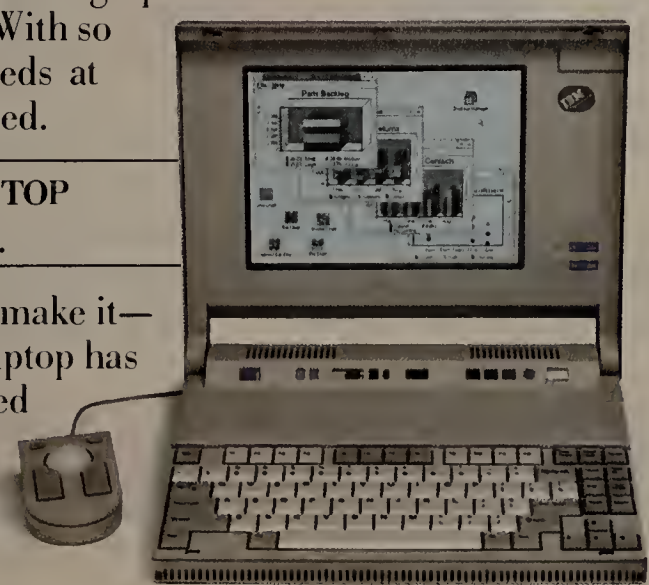
Instead of compromising comfort by altering the keyboard, the PS/2 Laptop has a full-size keyboard spaced and arranged the same way as a desktop PS/2's. And instead of squeezing information onto a pint-size screen, it has a sidelit LCD that offers a 10″-diagonal viewing area. It delivers sharp, clear text and graphics with VGA quality in 32 shades of gray. With so much to offer, the PS/2 Laptop succeeds at being small, without being small-minded.

The PS/2 Laptop Is One Laptop Not To Be Taken Lightly.

IBM knows it's not how small you make it—it's how you make it small. The PS/2 Laptop has system status icons that monitor assorted functions and battery life. Extensive power management controls include the ability to change batteries in the middle of an application without exiting and a special feature that suspends power when the screen is closed, then returns to full power when reopened, resuming applications where they were left off without the need to save to the hard drive.

Of course, it comes with an AC adapter, and a 2400 BPS Data Modem/9600 BPS Fax Modem is available, as well as a special mouse that doubles as a trackball when turned over. And the PS/2 Laptop comes with something no laptop should be without—an international warranty* backed by thousands of Authorized Remarketers worldwide, so service and support are never far away.

To find out more, contact your IBM Authorized Remarketer or IBM marketing representative. You'll see why with the new PS/2 Laptop, you don't need a whole lot of room to get a whole lot of computer.



How're you going to do it?

PS/2 it!

IBM®

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Better Windows

Solve memory problems
QEMM 386 makes the most of every last 'K'. DESQview uses that memory to run multiple programs.

Multitask
Run multiple programs side-by-side in windows. 'Background' programs can continue to run.

See text and graphics side-by-side
Reference information in your graphics program while writing your report.

Run Windows programs
DESQview even lets you run Microsoft Windows.

Easy menu access to programs and DOS services
Access programs or DOS in a window with just a few keystrokes or mouse clicks. It's that simple.

See multiple files
If your programs allow it, DESQview lets you run the same program in two or more windows. Great for comparing files

Cut and paste data
Transfer data between programs with a few keystrokes.

Handle large programs
Run standard DOS programs side-by-side with DOS-extended programs like 1-2-3 Release 3.

DESQview. The Multitasking, Windowing Environment.

Once the power user's secret, DESQview has been discovered by computer knowledgeable people everywhere. Over 1,000,000 people have bought DESQview.

INFO WORLD Product of the Year 1986, 1987, 1988, 1989 · PC WORLD BEST BUY · PC MAGAZINE EDITORS' CHOICE · PC MAGAZINE EDITORS' CHOICE · PC MAGAZINE EDITORS' CHOICE · PCComputing MVP MOST VALUABLE PRODUCT 1990

Multitasking; windowing, using keyboard or mouse commands, it's all easy with DESQview.

DESQview 386 2.3 lets you use your favorite DOS and DOS-extended programs in windows side-by-side on 386SX, 80386 and i486 PCs. As you can see above, you can even run Microsoft Windows within DESQview.

DESQview 2.3 gives 8088, 8086 and 286 PCs with additional memory most of the same capabilities with surprisingly little performance trade-off.

Whatever programs you use—DOS, extended DOS or Windows—and whatever hardware you have, whether 8088 or i486 or something in between, DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. When you look into it, it's the obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax (213) 399-3802

PRODUCT OUTLOOK

Edited by MIKE HOGAN

Dell System 320N, Dell System 212N

Next-Day System Replacement Backs 286, 386SX Notebooks

Dell's 320N has first-class notebook features, backed up by one year of on-site service and toll-free support.

Dell has jumped into the hot notebook market with both feet: a 20-MHz 386SX and a 12-MHz 286. And to make sure that users on the go never have to stop going for long, the company is adding a new wrinkle to its already first-class service/support package: a one-year on-site service contract that includes next-day system replacement wherever required. A technician will even come to a hotel and transfer your data to the replacement's hard disk, if possible.

At 8½ by 11 by 2 inches, these new VGA systems are among the smallest notebooks you can buy. Both are 6.4-pound featherweights with battery (only 7¼ pounds with the AC adapter/charger) and can easily handle memory-hungry applications like *Windows*, thanks to a comfortable 5MB RAM ceiling. Dell promises 3 to 4 hours of battery operation. A spare battery is $79.95.

The keyboards are terrific, featuring a layout that's close to a desktop unit's: dedicated cursor keys in the standard inverted T, plus dedicated page and function keys. The System 320N SX comes with either a 30MB or 60MB hard drive; the 286-based System 212N can be had with a 20MB or 40MB drive. Both include a built-in floppy drive and a mouse port.

Prices are OK but not earth-shattering. The 386SX-based 320N with 1MB of RAM and a 30MB drive is $3399. Make it $4396 in the standard *PC World* configuration (5MB of RAM, a built-in 2400-bps modem, a 30MB hard disk, and DOS)—roughly in the middle of the price range for comparably configured SX notebooks (see "386SX Notebooks: Portable Powerhouses" in this issue). The 212N is the place for the price conscious—you can get one with 1MB of RAM and a 20MB hard disk for $2399.

In any case, prices have to be considered in the context of Dell's record of good design and solid service and support.
—*Michael Goodwin*

IN BRIEF

Dell System 320N, Dell System 212N
Dell's full-featured notebooks are backed up by a next-day system-swap deal that will have you back computing quickly if something breaks.

Dell Computer Corp.
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/937-1470,
512/338-8700 (fax)
Reader service no. 676

INSIDE PRODUCT OUTLOOK

98 **Equity 386SX/20 Plus, Equity 386/25 Plus, Epson EISA Series** Epson's new line features a high level of integration and easy expandability.

100 **HyperAccess/5 2.0** Run remote machines almost as if you were there.

100 **Fastback Plus 3.0** You can practically automate the data-backup chore with this smart utility upgrade.

102 **Finalsoft Executive** Executive tools with groupware skills and *Windows* links.

103 **MouseBoard** Touch-typists needn't slow down to use this on-keyboard mouse.

104 **MultiFaxPC** Fax from your desk with a low-cost board that marries fax to a fast modem.

104 **Star Micronics LaserPrinter 4** This HP challenger claims to print graphics files 30 percent faster than the IIP and supports HP cartridges.

106 **Turbo Pascal for Windows, Borland C++ 2.0** Pascal programming for *Windows* developers, plus C++ enhancements.

106 **Type City** Mix and match Bitstream fonts and pay just for those you need.

108 **Niscan/GS Scanners** A family of talented hand scanners that rival desktops for OCR and graphics.

Equity 386SX/20 Plus, Equity 386/25 Plus, Epson EISA Series

Epson's New Equity Lineup Easy to Get Into for Upgrades

We have met the 486, and most of us have decided that a fast 386 or 20-MHz 386SX system offers a better price/performance balance for most applications. Epson is taking advantage of a pause in the ten-year-old chase after ever-faster processors to revamp its successful line of personal computers, focusing on aesthetics, convenience, and some aspects of PC performance that support faster processing speed.

The new Equity lineup extends from a 12-MHz 286 to a 486-equipped EISA system. But clearly, the center of interest lies somewhere between its Equity 386SX/20 Plus and Equity 386/25 Plus—each equipped with an ISA bus. Small-footprint PCs are the rage today, but that doesn't mean you want to sacrifice expandability. Epson meets that challenge through extensive use of SMT (surface mount technology) and VLSI (very large scale integration) and with a case design that allows easy access for expansion or repair.

Except for the tower design of the 486/25 version in the Epson EISA Series, the systems share a common case—about 15 inches wide by 17 inches deep by 6 inches high. Just turn the rear knob, and you can lift off the top and faceplate. Then you or your dealer can lift out the hard drive and power-supply chassis, making it easy to add or remove a drive from one of the three half-height bays. You also have complete access to the motherboard for snap-in SIMM memory upgrades. In addition, the three 8/16-bit slots and the one 8-bit I/O slot are in easy reach in case you want to add, say, a modem or network card.

All those slots are available for expansion because all standard functions are embedded in the line's common motherboard, starting with controllers that support two floppy drives in any 3½-inch or 5¼-inch combination; two fast 40MB or 100MB IDE drives; and embedded serial, parallel, and mouse ports.

The Equity 386SX/20 Plus has a super-VGA controller that gives you 16 colors at 800 by 600 resolution, and includes the new Edsun Laboratories Continuous Edge Graphics chip to smooth out your display's "jaggies" and provide a palette of more than 740,000 colors at an "apparent" resolution of at least 1536 by 1280. The Equity 386/25 Plus provides an extended VGA resolution of 1024 by 768 and will acquire CEG capability this summer. Both the Equity 386SX/20 Plus and the Equity 386/25 Plus ship with 2MB of memory expandable to 16MB (the 386SX/20 Plus can take only 14MB of that on the motherboard) and 32K of 25ns cache memory for no-wait performance.

Designed for work either as network servers or as high-end personal workstations, Epson's pair of EISA-based machines feature the same high level of integration and easy expandability that the ISA machines have. In the Epson EISA Series desktop, you'll

Introducing Pocket Edition™ 2400

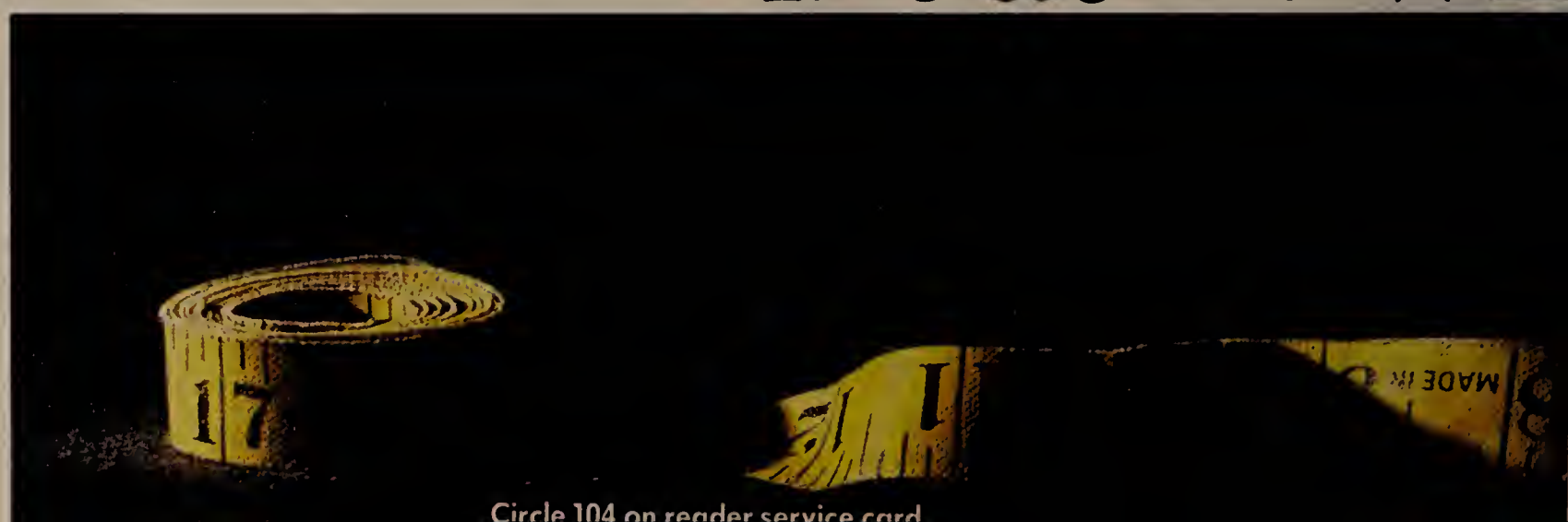
The people who wrote the book on modems proudly present the Pocket Edition. The first Hayes modem specially designed for people who use laptop and notebook computers.

Weighing in at a slight three ounces, the Pocket Edition 2400 comes with everything you need to take it on the road—a 9-pin connector, cables, a handy carrying case, and our simple-to-use Hayes Smartcom EZ communications software.

And, because it gets all its power from the phone line and your computer's serial po you'll never find yourself searching for a outlet to plug it into.

The Pocket Edition is incredibly comp yet it contains many of the features you expect from our "full-size" Hayes modem It's ideal for working remotely with your

Once again, Hayes has set modems wil



Circle 104 on reader service card

Epson has revamped its PC line to give you small-footprint, easy-open 386s with a high level of integration and high-end graphics.

find the same chassis, three half-height bays, and four slots as in the ISA machines, but the EISA slots accept either standard XT/AT cards or 32-bit bus masters.

The Epson EISA Series tower has seven EISA slots and six half-height drive bays. Both ship with 4MB of RAM—the desktop expandable to 32MB and the tower expandable to 64MB, all on the system board. The desktop ships with 64K of 25ns cache, upgradable to 128K, while you can take the tower from 128K to 256K. Both the tower and the desktop have extended VGA graphics and a card that plugs into the system board: You can plug a 33-MHz 386 or a 25-MHz 486 card into either Epson EISA Series model.

In single-floppy configurations, the Equity 386SX/20 Plus is $2299: It's $3449 with a 100MB hard drive. The 386/25 Plus is $3499 and $4999 with a 100MB hard drive. The Epson EISA Series will be launched in June, and prices have not yet been set.

IDE hard drives can be added: $759 for a 25ms 40MB and $1479 for a 25ms 100MB. A 13-inch color VGA monitor is available for $599, while an extended VGA color multiscan monitor with resolution up to 1024 by 768 can be had for $689. Add another $95 for DOS version 3.3 or $125 for DOS version 4.01, and you'll get a copy of *Windows 3.0* thrown in free. —*Mike Hogan*

IN BRIEF

Equity 386SX/20 Plus, Equity 386/25 Plus, Epson EISA Series

Epson rounds out its Equity line with a high level of integration, the highest-quality graphics, and plenty of room to grow.

Epson America, Inc.
20770 Madrona Ave.
Torrance, CA
90509-2842
800/289-3776
Reader service no. 664

mpany's computer system. It keeps you in uch with electronic mail. You can even use to deliver a FAX with an on-line service.

And while the Pocket Edition was created r people on the go, it's also a great space-ver for those who stay at home.

At the suggested retail price of $179 (and with our unique Hayes performance warranty and money-back guarantee), you'll find the Pocket Edition extremely easy on your pocketbook.

For more information about the new portable Pocket Edition 2400, call us at 1-800-635-1225.

It's time you gave your laptop a new traveling companion.

Hayes®

Our technology has the computer world talking. More than ever.

the standard by which all be measured.

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HyperAccess/5 2.0

General-Purpose Communications and Remote Access in One

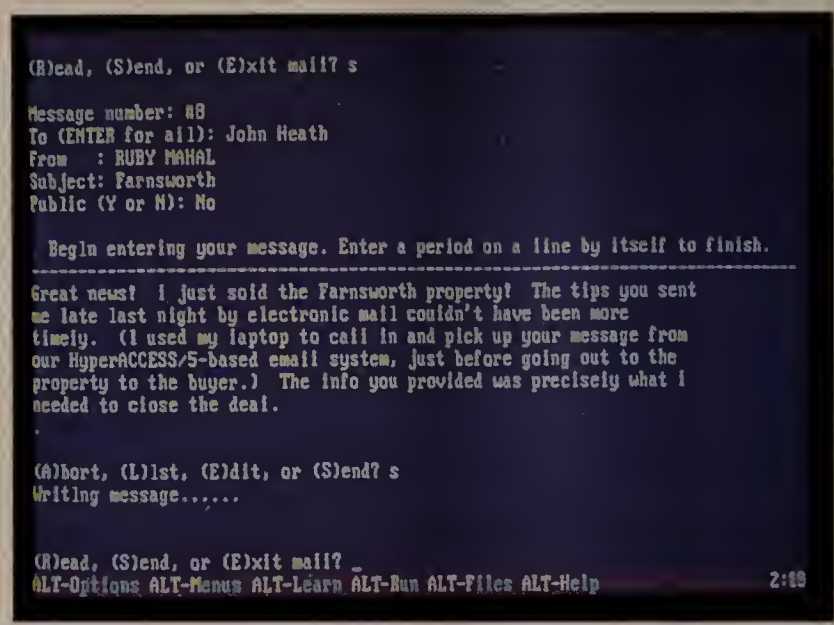
The latest release of *HyperAccess/5* improves upon many of the special features that made the program ideal for all types of communications. Plus, now you can use *HyperAccess/5 2.0* to dial into a remote computer and run character-based programs or even access system software.

HyperAccess/5 still compresses files on the fly while sending and automatically protects your system against viruses that might be inadvertently downloaded. But version 2.0 protects against 130 common viruses, more than twice as many as version 1.1.

The script language has been beefed up in many ways, including the addition of IF...THEN...ELSE statements and a dozen new commands such as GOTO and GOSUB. You can completely automate your calls, build fancy interfaces, and perform intricate polling applications. Despite the added functionality, Hilgraeve has redesigned the program to use extended memory and overlays, reducing conventional memory requirements by 100K to 250K.

But the biggest change remains the remote-access capability. You can call up a DOS- or OS/2-based computer from your DOS or OS/2 computer—it doesn't matter which. If both are running *HyperAccess/5 2.0,* you can operate the remote machine almost as if you were sitting in front of it. Diagnose problems at a far-off computer site, accept data into an application from a crosstown PC, even create documents or programs composed jointly by people at different locations.

One restriction: You can't run graphics-based remote applications. Nor can you operate remote applications within a window under *Windows.* You can, however, use *HyperAccess/5 2.0* under *Windows 3.0* and run full-screen character-based applications on a remote machine.



HyperAccess/5 2.0 lets you set up a remote host that work group members can dial into to use E-mail or to run character-based applications.

For unattended security, you can program 250 user passwords. You can restrict users to E-mail, directory, file transfer, or file management functions and specify who can run applications or access system software. The suggested retail price is $199 for a DOS- and OS/2-capable package or $99.95 for the DOS-only product. An upgrade costs $29.95 for registered owners of past versions and $39.95 for users of competitive products. —*Mark Henricks*

IN BRIEF

HyperAccess/5 2.0
Remote access, advanced scripting, and a reduced memory bite add up to a tough version to follow.
Hilgraeve Inc.
Genesis Centre
111 Conant Ave., Ste. A
Monroe, MI 48161
800/826-2760,
313/243-0645 (fax)
Reader service no. 665

Fastback Plus 3.0

Easy New Backup Choices Save Time

If you've ever lost a hard disk, you know the importance of backing up your work; it's just that none of us likes to buy that security with precious time. Fifth Generation's $189 solution is *Fastback Plus 3.0.*

This version lets you back up by characteristics, such as file name, extension, size, date, time, and attribute. You can include and exclude files by attribute, so you don't have to, say, back up those big, archived CAD files or your system files. An expanded macro capability lets you launch a complex backup routine at a keystroke, and you can schedule your backups to run automatically at regular intervals and times of day—like every midnight when you're safely tucked in at home. *Fastback*'s new DES encryption will protect your data from prying eyes.

Conceivably, you can write a macro so specific that your incremental backup will fit on a single floppy (or two, if you have both A: and B: drives). But you can back up to any logical device—a network server, say, or a special directory on your hard disk—and a tape version of the program is imminent.

IN BRIEF

Fastback Plus 3.0
Selective backup with macros and a character-based windowing interface make backups faster and easier.
Fifth Generation Systems
10049 N. Reiger Rd.
Baton Rouge, LA
70809-4562
800/873-4384,
504/295-3268 (fax)
Reader service no. 670

Fifth Generation claims to have added to version 3.0 a few of the qualities that have made its *Fastback for Macintosh* a kinder, gentler backup solution. Among these is the new mouse-driven character-based windowing interface, so you can pull down menus and point and click on what you want. You choose between the Express menu, designed with the novice in mind, and the Short/Full selection of expanded backup alternatives, including a macro capability for more experienced users.

Fastback offers error correction, data verification, and warning against accidental overwrites so that your backup will do what it's supposed to do: ensure your data to safekeeping. —*Cathy Smith*

"We're ready for a more powerful SX. I'm choosing the Acer 1120/SX."

When you are ready for a computer crafted entirely by a single corporate hand that delivers no-compromise 386SX performance, superior VGA graphics, and the power to run the software of today and tomorrow, you're ready for the Acer 1120/SX.

Loaded with the new Intel® i80386SX™ running at 20 MHz, it has standard 2 MB of fast system RAM expandable up to 8 MB (with an optional factory-installed 100-MB hard drive), integrated high quality VGA video, built-in parallel, serial, and mouse ports, a choice of either a 3.5" or 5.25" floppy disk, and a PS/2 mouse.

The surface mount design of the motherboard greatly increases the reliability of the Acer 1120/SX, and results in a more compact footprint. With no switches to set, installation is easy. A password security feature protects your data, and you can choose from a full line of AcerView VGA monochrome and color monitors to complete your systems purchase.

Bundled with MS-DOS® 3.3, and MS-Windows® 3.0, the Acer 1120/SX also supports OS/2®, UNIX®, XENIX®, and NOVELL® NetWare and is backed by our rock-solid 2 year warranty.

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Finalsoft Executive

Keeping Managers on the Go Productive

If you're an executive on the go, you no doubt have a tight schedule and need a tight schedule planner. And it probably wouldn't hurt if most of your other productivity tools were wrapped up with your appointment calendar in a single neat package.

Finalsoft Executive answers most of your wishes by bundling together a full-featured personal agenda and calendar with an alarm clock, a to-do list, a calculator, and other tools you may need on a busy day. *Executive* also provides an effective text editor with several of the necessary amenities, such as center, align, bold, italic, underline, and formatting.

It's all under the familiar *Windows 3.0* interface and, thanks to *Windows'* Dynamic Data Exchange capability, you can easily link to other *Windows* applications and share data. Likewise, since no executive works alone, neither does *Executive.* Running on NetWare or any NETBIOS network, the program goes beyond the average PIM or contact manager to incorporate several groupware niceties.

The group scheduler gives you access to the calendars of everyone in your group so that you can set up an important meeting or reserve a conference room without playing excessive phone tag. The salesperson in you (or any you may supervise) will appreciate the phone directories and programmable phone-dialer that keeps trying until it makes a connection. Thanks to a *dBASE*-compatible data base, everyone in your work group can share any phone lists you want to make available.

Executive's groupware functions extend to a form of hypertext links in its editor. You can include up to ten keywords per document; clicking on any of them opens another window with additional information. As many as ten users on a LAN can add links to a text file concurrently. Different group members can also redline documents and add comments electronically.

The built-in E-mail lets you discuss these changes without leaving your desk or tying up your phone. Starting with the $445 six-user version of this $249 package, you can have a post office on a server giving E-mail capabilities to a network. Those include the abilities to maintain multiple mailing lists and to add unlimited attachments to your messages. If you want to limit access to some files and subdirectories, *Finalsoft Executive* provides a password-protection scheme.

Executive requires a 286, DOS 3.0 or a later version, *Windows 3.0,* 1MB of RAM, and a hard disk. —*Susan Lusty*

IN BRIEF

Finalsoft Executive
A handy bundle of executive tools provides groupware capabilities and links to Window applications.

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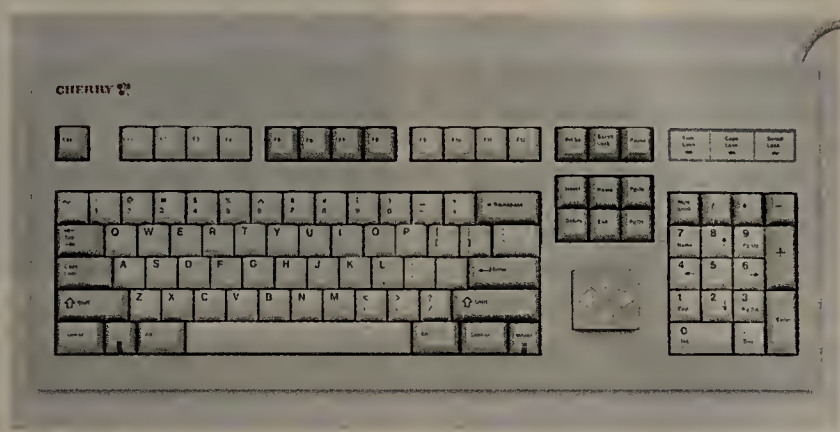
MouseBoard

Fingertip Mouse Control Without Leaving Your Keyboard

Mice have always been something of a keyboard aside, but with the increase in mouse-run programs, Cherry Corporation figures that it's time for your mouse to join your other keys.

Of special interest to touch-typists, Cherry has dropped a mouse onto the panel of the new 101-key keyboard that it calls the MouseBoard. You'll find it where most keyboards put their arrow keys. In fact, the arrow keys on the MouseBoard do double duty—sort of. Push a mouse button on the bottom right corner of your MouseBoard, and it activates the MousePanel on which those keys sit, letting you mouse around the screen without your fingers having to leave the comfort of the keyboard.



With the MouseBoard, you never have to take your fingers off the keyboard to navigate graphical screens.

The entire MousePanel moves about 16 millimeters up and down and from side to side so that you can slide your on-screen pointer around just as you do when you roll a mouse. You can adjust the speed or sensitivity of the Microsoft-compatible mouse movement on a scale from 0 to 10. The mouse gives precise control with slow movements but can still zoom across the screen. Push the mouse button with its LED again, and the mouse keys turn back into the four arrow keys. But you still enjoy the panel's freedom of movement that lets you move quickly in spreadsheets and other applications.

The $349 MouseBoard comes with installation software and drivers for PC, XT, 286, and 386 machines. It also works on an IBM PS/2, but a $10.96 PS/2 adapter cable is required. Function keys run across the top in the 101-key keyboard format. —*Susan Lusty*

IN BRIEF

MouseBoard
The flow of typing is not interrupted with the MouseBoard, a keyboard that comes complete with an integrated mouse.

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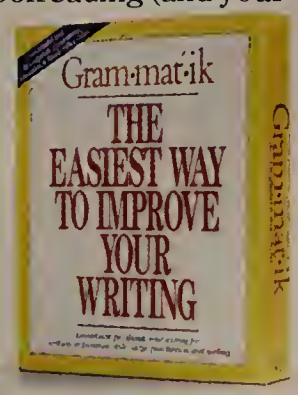


Circle 282 on reader service card

MultiFaxPC

V.32 Modem/Fax Combo Card Add-In

If you send a lot of files and faxes to remote locations, Multi-Tech can save you time with MultiFaxPC, one of the first add-ins to combine a fax with a high-speed 9600-bps modem. And you can get both for only about $100 more than you would pay for a V.32 9600-bps modem alone.

MultiFaxPC lets you send or receive fax files in the background; an on-board processor and 64K of RAM make sure these processes don't interrupt foreground tasks. The program keeps you aware of incoming faxes—as well as the status of outgoing ones—via an unobtrusive one-line display or a beep. An automatic activity log lists faxes sent and received along with time, date, address, and other pertinent information. You can schedule transmissions to occur at a later time or date.

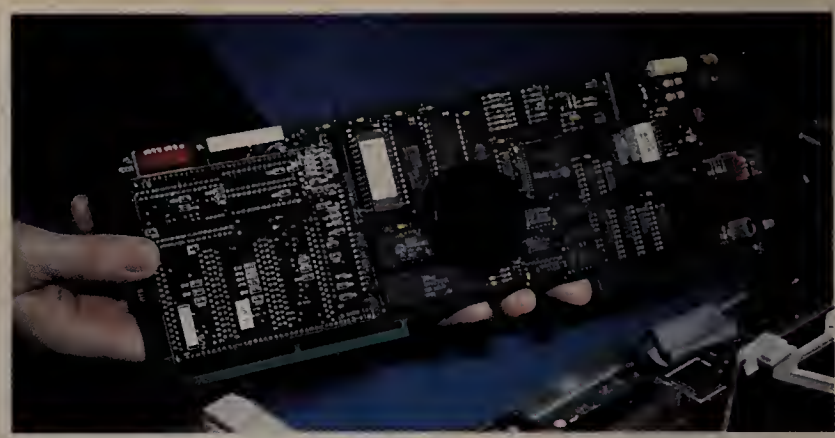
You can't edit with MultiFaxPC, but you can view fax files and cut portions of them to save to a PCX or TIFF file for later insertion into other files. That capability lets you attach logos, signatures, and cover sheets to your faxes.

The new MultiFaxPC board performs all necessary fax functions, but you may find actually sending a fax somewhat more awkward than with Intel's new SatisFaxtion board. Like SatisFaxtion, MultiFaxPC lets you fax any file created by an application that supports the Epson FX-80 printer, but MultiFaxPC lacks Intel's TSR capability, preventing you from sending a fax from within that application. Instead, there is a multistep process in which you switch back and forth between Multi-Tech's fax software and the DOS prompt.

More cumbersome than the SatisFaxtion method, MultiFaxPC's doesn't support the CAS standard for applications that include faxing in their menus. But if you can't afford the conventional and/or expanded memory that lets SatisFaxtion perform its magic, you may not mind the extra steps. Likewise, you also get a much faster modem than SatisFaxtion's 2400-bps variety.

For nonfax files, the MultiFaxPC's V.32 9600-bps modem supports V.42 error correction and MNP-5 and V.42bis data compression. The modem works with all popular communications software, but Multi-Tech throws in *Qmodem SST* for good measure.

The MultiFaxPC lists for $999, a good value considering that today's V.32 modems alone cost nearly that much. It requires DOS 2.0 or a later version, 512K of RAM, a hard disk, and any full-length 8- or 16-bit slot. —*Art Wilcox*



MultiFaxPC combines a fax with a high-speed modem on a single board—for only about $100 more than you'd pay for the modem alone.

IN BRIEF

MultiFaxPC
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Star Micronics LaserPrinter 4

A Different Clone

When the HP LaserJet IIP hit the streets in September 1989 as the first sub-$1000 laser, it caused a small revolution in the printer market—and shots are still being fired. The latest salvo comes from dot matrix maven Star Micronics. Its LaserPrinter 4 has two features that separate it from the me-IIP crowd: support for HP cartridges and a fast RISC processor.

The 300-dpi LaserPrinter 4 lists for $1495, so you can probably find it for about the same price on the street as the IIP. It uses the same 4-ppm Canon engine and features a similar small-footprint design. It's also the only clone printer that accepts IIP-compatible font cartridges. Star sweetens the deal by throwing in a free cartridge containing 151 bit-mapped fonts.

What sets this printer apart is its 10-MHz Intel i960 RISC processor, which is significantly faster than the IIP's poky Motorola 68000. Star claims the LaserPrinter 4 prints graphics files more than 30 percent faster than the IIP, thanks to the processor's ability to speed throughput.

But RISC really becomes a factor when crunching calculation-intensive PostScript files. That's one reason Star plans to offer a $399 PostScript-compatible board, complete with the standard 35 scalable font outlines. Figure another $299 for the required extra megabyte of RAM, and you still have the cheapest RISC-based PostScript clone on the market.

The printer comes with 1MB of RAM (compared to the IIP's 512K), which Star claims is enough to handle a full letter-sized page of graphics. But if you want to download buckets of fonts, mix multiple fonts and graphics, or print legal-sized pages, you'll need more memory—and RAM is strictly proprietary. A 2MB upgrade costs $499, a 4MB board $999.

Like the IIP, the LaserPrinter 4 has 14 resident fonts and handles the usual paper categories, including envelopes, labels, and transparencies, via a 50-sheet fold-down tray. An optional 250-sheet cassette is available for $195. —*Daniel Tynan*

IN BRIEF

Star Micronics LaserPrinter 4
A RISC processor and a low-cost PostScript upgrade make this a IIP clone with a difference.
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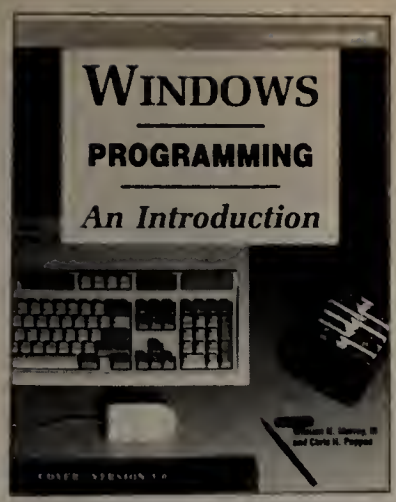

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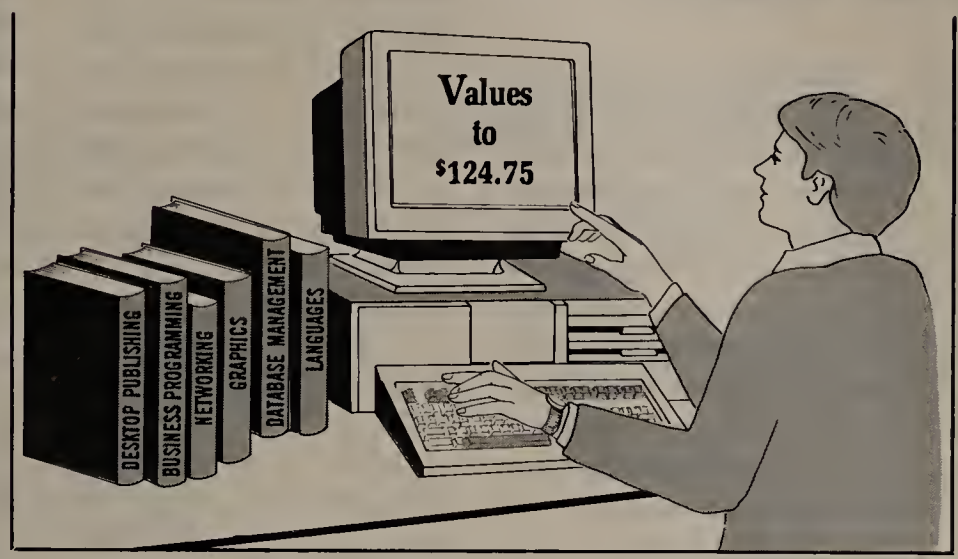

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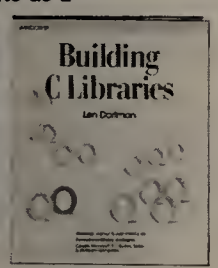

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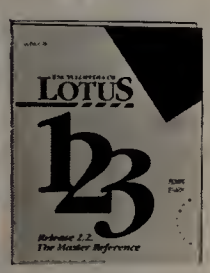

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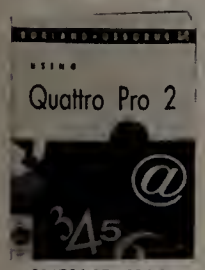

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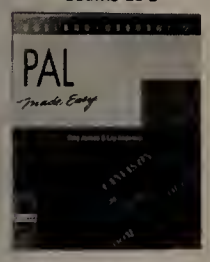

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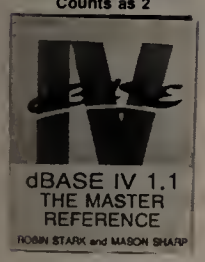

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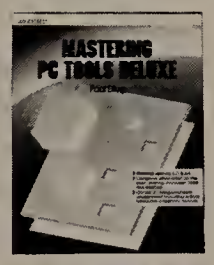

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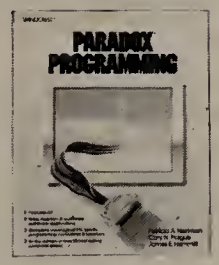

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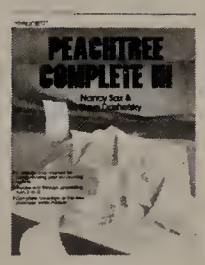

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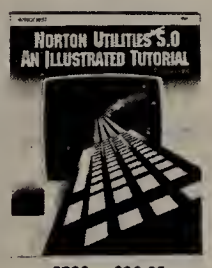

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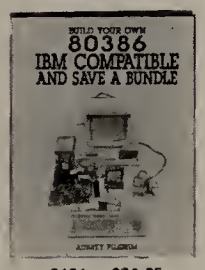

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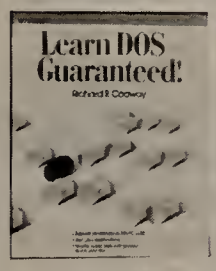

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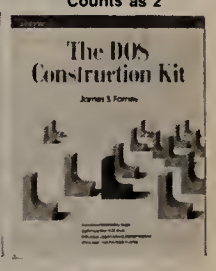

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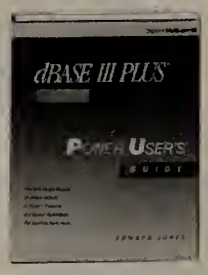

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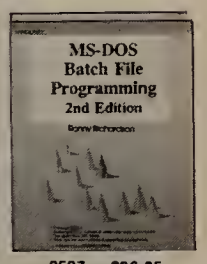

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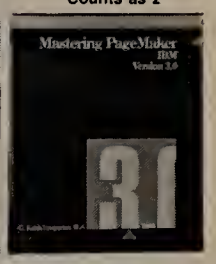

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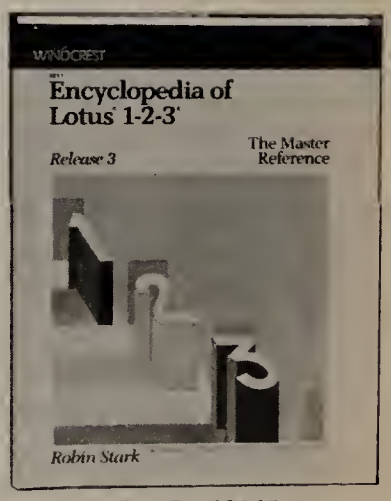

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Turbo Pascal for Windows, Borland C++

Borland Tools for Doing Windows

Windows 3.0 has become everybody's favorite programming environment, but *Windows* programs are as hard to write as they are easy to use. Microsoft's *Windows Software Development Kit* (*SDK*) is a mammoth collection of manuals detailing close to 600 functions and parameters, leading some wags to suggest that the reason *Windows* programs are so good is that only the best programmers ever complete them.

Borland takes up that challenge with *Turbo Pascal for Windows*, a $250 integrated development environment (IDE) that offers many of the advantages that helped *TP* for DOS make programming easy and affordable. If you're a competent *Pascal* programmer—especially if you're familiar with the object-oriented extensions to the language that Borland introduced with *Turbo Pascal 5.5*—*TP for Windows* should make writing *Windows* programs a straightforward proposition.

One of the toughest jobs is creating your program's interface, but you'll be a step up if you're familiar with *Turbo Pascal*. Included in the package is Object Windows Library (OWL) for working with the *Windows* interface. OWL is similar to Turbo Vision, the highly structured object library that comes with *TP 6.0*. Unfortunately, OWL isn't compatible with Turbo Vision, so you won't be able to convert your *TP 6.0* DOS-based programs to *Windows* just by recompiling the code. But you do have a familiar paradigm in which to work. If you prefer, *TP for Windows* also comes with a version of the Whitewater Group's *Whitewater Resource Toolkit*, a utility for creating *Windows* interfaces.

There's also a version of the Turbo Debugger that can debug your *Windows* programs. Unfortunately, the debugger itself is text based, illustrating the complexity of programming in the environment. (Not even Microsoft has been able to create a source-level debugger that works in *Windows*.) Borland's debugger flips into *Windows* mode when you view your program screen.

Armed with these utilities, you should be able to create great *Windows* programs without having to spring for Microsoft's $500 *SDK*. To Microsoft's credit, it has let Borland license the one essential part of the *SDK*, the resource compiler, and integrate it into *TP for Windows*.

While *TP for Windows* is intended at least in part for amateurs, *Borland C++* is definitely a professional tool. The word *Turbo* has been dropped from the name—the first Borland language product without it—because Borland felt that C programmers associate the name with nonprofessional tools. *Borland C++* replaces *Turbo C++ Professional* but not the regular *Turbo C++*.

Unlike *TP for Windows*, *Borland C++* is not a *Windows* program. Its character-based IDE runs under *Windows* as a text program. But when you compile, *C++* gives you the option of creating either a DOS or a *Windows* application.

New features in this $495 kit include 386 protected-mode compiling, precompiled headers (so you don't have to compile all your headers repeatedly), a built-in assembler (like the one in *Turbo Pascal 6.0*), and unlimited undo and redo. *Borland C++* comes with the same version of the Turbo Debugger as *TP for Windows*, along with the *Whitewater Resource Toolkit* and the integrated resource compiler. —*Lincoln Spector*

IN BRIEF

Turbo Pascal for Windows, Borland C++ 2.0
Pascal's ease of programming comes to Windows 3.0, while C++ enhancements speed debugging and compiling for professionals.
Borland Int'l
1800 Green Hills Rd.
Scotts Valley, CA 95066
408/438-5300
Reader service no. 667

Type City

Some From Column A, Some From Column B Make a Full Plate

Buy the fonts you need now, then add what you want as you want them: That's the idea behind Type City. It makes sense, considering that analysts expect the average laser printer user to buy hundreds of dollars' worth of fonts this year. Even if you aren't a big spender, font selection is as personal as any activity in personal computing, and you want the freedom to choose.

Well-known downloadable font slinger Bitstream has assembled a gourmet smorgasbord of the most popular typefaces used in Hewlett-Packard LaserJet-compatible and PostScript printers and put them in its first cartridge—a faster way to access add-on type. You get all of the old favorites—Swiss, Zapf Calligraphic (Palatino), Letter Gothic, and more. Unlike most super cartridges, Type City includes fonts scalable between 7 and 36 points as well as headlines and business symbols. For the fast-growing group of *Windows* users, Bitstream provides display version of its Type City fonts, so screen output will match printer output.

IN BRIEF

Type City
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Bitstream, Inc.
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617/497-6222,
617/868-0784 (fax)
Reader service no. 671

But Type City's real power lies in its expandability. Included in the $379 base unit are four minislots into which you can insert any of eight add-on IC cards. Each retails for between $99 and $129 and is about the size of a credit card, ending the days of the stack of font cartridges teetering on the laser printer. Bitstream tosses in a card called Deli for free—a collection of three typefaces that includes Bitstream's version of Helvetica Monospace, and headlines.

You also can order your own selection from Bitstream's 250 font families and add your own logos and symbols for prices starting at $150. You need a computer with 512K of memory, a CGA or better graphics adapter, and a hard disk, but no additional printer memory. —*Mike Hogan*

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Keyboard	*Standard AT-compatible* *3mm key travel depth*	*Enhanced keyboard* *2.5mm key travel depth*
Memory	*1MB expandable to 5MB*	*2 MB expandable to 10MB*
Software Incl.	*Laplink III* *MS-DOS* *Windows 3.0*	*Not available*
Support	*Toll-free 800 number* *On-line modem support*	*Not available*
Price	*20MB - $3999* *40MB - $4499*	*30MB - $6499* *60MB - $6999*

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Circle 265 on reader service card

Niscan/GS Scanners

Windows Scanner Comes Easily to Hand

Maybe you're a little short on dollars. Maybe you're a little short on desk space, or maybe you want to be able to scan that rounded left-hand column on the right-hand page of the *Encyclopaedia Britannica.* Under many circumstances, one of the hand-held scanners from the Niscan/GS family may be a better fit than a desktop alternative whose price can run as much as eight times higher.

Hand scanners have always bowed to their larger cousins in terms of registration quality and the size of the swath they cut. But some recent advances in software can compensate for an unsteady hand and let you knit together the pieces of a large scanned picture.

Nisca lists four flavors of hand scanners. The barebones $369 Niscan/GS also comes in a $399 *Windows 3.0* version; both offer 8-bit image scanning in 256 shades of true gray, achieved through hardware controls rather than simulated in software. For an additional $200, Nisca includes OCR-enhancing software: The Niscan/GS OCR costs $569, while the Niscan/GS OCR for *Windows* lists for $599.

Any of the scanners can bring photos, line art, and logos via IMG, PCX, and TIFF files into the most popular publishing, word processing, and paint/draw programs —including *PageMaker, WordPerfect 5.1, Microsoft Word,* and *PC Paintbrush.* The Niscan/GS scanners let you grab art in 4.2-by-11-inch swipes at speeds that decrease and file sizes that grow as you move from resolutions of 25 to 400 dots per inch. Scan at lower resolutions if you're in a hurry, hurting for hard disk space, or want artsy grainy image effects.

All models come with the usual array of prescan controls and postscan darkroom-style editing tricks such as image flipping, posterization, and touch-up. The non-*Windows* models use *GEM*-based *ScanXpress* software for prescan controls and postscan image editing, while the *Windows* models use Image-In's *Scan&Paint* scan-control and paint program and Image-In's *Plus* postscan gray-scale editor.

But newsletters and such do not live by pictures alone. Niscan/GS OCR automatically identifies blocks of text. Then its *Cat Reader Professional* software takes the text down in ASCII and menu-selectable *WordStar, WordPerfect,* and *Microsoft Word* text formats in 8- to 24-point type at up to 50 characters per second. *Cat Reader* also includes a built-in text editor and 50,000-word spell checker.

But here's where the value of the *Windows 3.0* multitasking environment really comes to the fore. Niscan/GS OCR for *Windows* lets you use *Scan&Paint* to scan graphics into one window and edit with Image-In's *Plus.* Then, in another window, you use the bundled *Perceive Personal* by Ocron to bring text into a *WordStar, WordPerfect, Word,* or ASCII file in 8- to 36-point type at up to 150 characters per second. Meanwhile, your newsletter or other DTP application is in a third window, into which you can bring

Eeeek!

New APPLAUSE II™ version 1.5 is the easiest way to create spectacular business graphics. And the free Microsoft Mouse inside each box (a $125 value) makes it even easier and faster. Because

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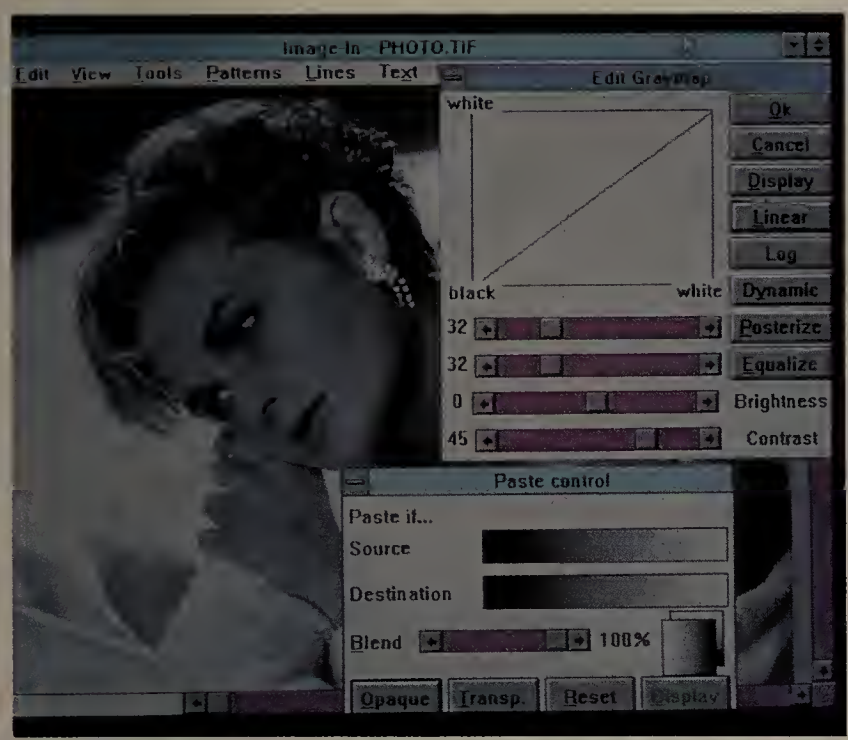

Nisca's Windows-based scanners use Image-In software to capture images, which you can move among documents using Windows' Clipboard.

scanned-in text and graphics via the *Windows* Clipboard. This way, you don't have to bounce between different programs opening and closing files and, because all of this is done from the same *Windows* menu bar, you never have to be concerned about which software you're using. In fact, you could scan in text and graphics simultaneously, but the quality of both would suffer, and the corrective editing you would have to do later would take longer overall than using different windows.

Image-In offers 15 different paint and draw tools for fill, brush size, patterns, shapes, paste control, flipping, and rotating. The omnifont technology in *Perceive Personal* reads just about any type style without the need for the character training.

Nisca offers upgrades from Niscan/GS to Niscan/GS for *Windows* for $49 and from Niscan/GS OCR to Niscan/GS OCR for *Windows* for $149. Users who have a prior version of Niscan/GS OCR for *Windows* with Image-In's *Read* can upgrade to *Perceive Personal* for $49.

Niscan/GS and Niscan/GS OCR require an XT with an 8-bit slot, DOS 3.0 or a later version, a hard disk with 2MB of available space for Nisca software, and a CGA or better graphics adapter. Niscan/GS for *Windows* and Niscan/GS OCR for *Windows* require a 286-based computer with an 8-bit slot available, DOS 3.0, *Windows 3.0*, an EGA or better graphics adapter, and at least 2MB of hard disk space.
—*Mike Hogan*

IN BRIEF

Niscan/GS scanners
Scan handily at any price point, but for the ultimate in OCR and graphics hand scanning, look at Niscan/GS OCR for Windows.

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214/245-0942
Reader service no. 677

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InfoWorld says APPLAUSE II is "easier to work with than either Harvard Graphics or Freelance Plus, and faster than the Windows-based products." And *PC Magazine* says APPLAUSE II has "a fluidity and ease-of-use not found in either Harvard Graphics or Freelance Plus."

Version 1.5 adds an 80,000-word spelling checker, full LAN capability, 700 pieces of clip art, and much more. Including an all-new RunTime that lets you show screenshows to colleagues who don't have APPLAUSE II.

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Circle 9 on reader service card

Web Network Operating System

Peer-to-Peer Network Boasts Speed, Security, Ease of Use

LAN installation and maintenance have long been the province of techies. Certainly, they're not tasks for which the average manager or small-business owner has the time or the expertise. But the Web peer-to-peer network operating system has been designed for just such nontechnical users in small to medium-sized work groups.

The installation process is simplified from the start by Web's support of Novell's IPX (International Packet Exchange). This protocol lets the peer-to-peer OS operate with any network adapter that ships with a NetWare driver; most do, including token ring, ethernet, and ARCnet cards. Better still, the OS reads the parameters needed for setup, such as interrupts and memory locations, directly from those adapters. Web is indifferent to network topology, so you can go with ring, bus, or star.

Users interact with Web via the Station Manager, which runs as a TSR or a stand-alone and is the way to set up and access network files, shared devices, and E-mail. Web makes all drives and files available to all users from any workstation and displays available resources on screen in a tree format. You can even back up the entire network from any station.

You or the network administrator can also use the Station Manager to set access levels: station, drive, directory, file, and device. Print management includes print spooling for both serial and parallel printers, plotters, and other external devices. Both the person sending a file and the owner of the device can start, stop, and remove the spooled file from the device's queue. You use the Station Manager, from DOS or from within an application, to manage the queue and local devices.

A rather rudimentary memory-resident messaging system creates mailing lists but lacks basic LAN E-mail features such as copies, blind copies, attachments, and the ability to file incoming messages into folders. It also lacks support for the MHS messaging system supported by Novell LANs, so you can't communicate with co-workers beyond the bounds of your own network.

The system takes up approximately 55K of conventional memory on each workstation and requires an additional 6K for the NetWare driver. The product costs $495 for a 5-user license, $995 for a 15-user license, and $1495 for a 30-user license. —*Cheryl Goldberg*

IN BRIEF

Web Network Operating System
An easy-to-use peer-to-peer LAN with souped-up performance and network security, though modest E-mail capabilities.

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NOW READ WHAT THE REAL EXPERTS SAY ABOUT XTREE.

"It stands alone as the fastest, most imaginative and most capable file manager you can find."

PC Magazine

Some software companies would have you believe their file management packages do everything but make coffee. But nobody's fooling the pros. With its long list of practical, usable features, XTree has been their favorite for years. InfoWorld says, "This comprehensive DOS shell is packed with advanced features that appeal to power users."

Features like an application menu that lets you launch applications right from XTree. And when you're launching applications it shrinks back to 7K. Like an Open File command that makes starting applications and their associated data files as easy as pointing and shooting. Like split screens, so you can view two directories or drives at once. Like text search. And AutoView, so you can browse through files without starting up the application.

Now, there's an even better reason for managing your files with XTree. It's XTreeGold 2.0, with some important new features that make it better and more useful than ever.

Introducing New XTreeGold 2.0. With Simplified Pull-Down Menus, "Un-Delete", And Autobuild Menu Creation.

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We're doing some horse trading of our own. XTree owners can upgrade to XTreeGold 2.0 for $39. Call 1-800-282-5003.

Circle 319 on reader service card

Until now, sharing a printer could cause excessive wear on some of your equipment.

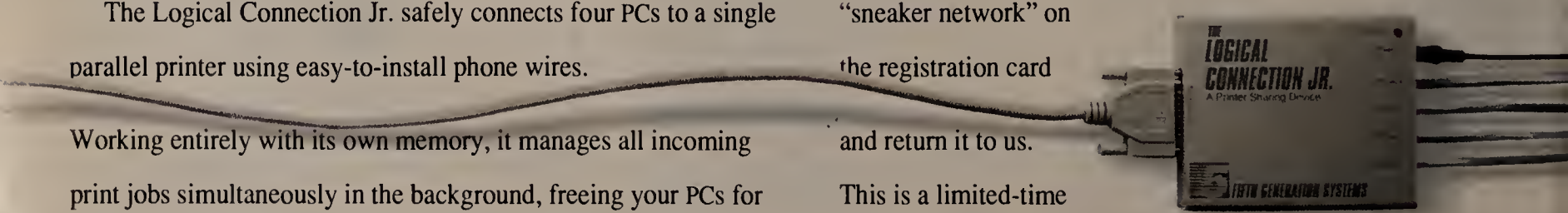
If you're on a sneaker network running between several PCs and one printer, your patience and productivity—among other things—are probably wearing a little thin.

And it could be worse. Major manufacturers report that you may actually damage your laser printer if you use a mechanical switchbox. But now there's The Logical Connection Jr.™

The Logical Connection Jr. safely connects four PCs to a single parallel printer using easy-to-install phone wires.

Working entirely with its own memory, it manages all incoming print jobs simultaneously in the background, freeing your PCs for business while it prints jobs in the order received. And although it runs beautifully without any software, it comes with a powerful utility program that maximizes printing speed. And it does all that for less than $60 per PC.

To find out more about The Logical Connection Jr., call 1-800-873-4384. Buy it, and we'll foot the bill for a free copy of Mace Performance,™ the $69 hard disk optimizer. Just write "sneaker network" on the registration card and return it to us. This is a limited-time offer, so step on it.



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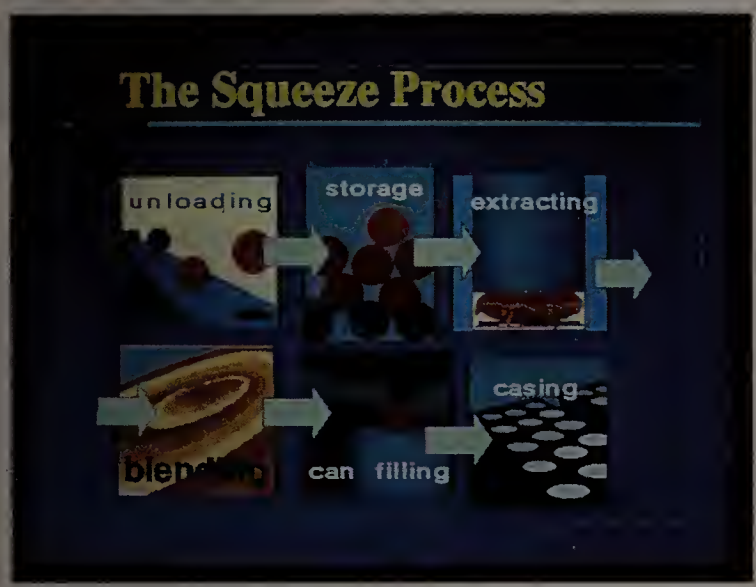
Circle 235 on reader service card

UPDATE

New Versions of Your Favorite Products

Freelance Graphics for OS/2



Freelance Graphics for OS/2 allows you to create colorful desktop presentations using fill-in-the-blanks page templates.

Freelance Graphics for OS/2 can speed the creation of your desktop presentations with fill-in-the-blanks page templates. You select a background, add text and graphics, and let *Freelance Graphics'* templates manage the sizing, placement, and formatting consistently across type and design styles. The $400 program, which supports *Adobe Type Manager*, includes the usual presentation charting, drawing, and editing tools. Upgrades from the DOS version are $150. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142; 617/693-1819.

Reader service no. 681

SoftType 1.02

In its newest upgrade, ZSoft's *Windows*-based font scaling and design software gains support for Type 1 PostScript fonts and the HP DeskJet printer line. You can now augment *SoftType*'s 63 scalable font outlines with Type 1 fonts from a variety of manufacturers. Users will be able to employ *SoftType*'s unique font design capabilities to create their own Type 1 outlines. They then can install the outlines into *Adobe Type Manager*, the *Windows 3.0* package that lets you scale fonts on the fly. The suggested retail price is $199 and $10 for upgrades. ZSoft Corp., 450 Franklin Rd. #100, Marietta, GA 30067; 404/428-0008.

Reader service no. 678

LaserJet IIP

Hewlett-Packard has reduced the price of its 4-ppm personal printing factory, the LaserJet IIP, by $200 to $1295. Hewlett-Packard also has cut the price of the version that includes Adobe PostScript, an AppleTalk port, and an additional 1MB of memory by $400 to $2195. This model has the same standard parallel and serial ports and the 14 HP PCL 4 fonts. Hewlett-Packard's 1MB memory board has been reduced by $105 to $230; the price of the 2MB board has been cut by $170 to $390. Hewlett-Packard, Customer Information Center, 19310 Pruneridge Ave., Cupertino, CA 95014; 800/752-0900.

Reader service no. 679

SuperPrint 1.1

Version 1.1 of Xenographics' *SuperPrint* utility gains the on-the-fly font scaling of Bitstream *FaceLift* fonts. Memory management advances reduce the need for memory upgrades, and fonts are scaled so quickly that you don't have to create a number of them up front and store them for use as needed. A *Windows 3.0* utility, *SuperPrint* version 1.1 now supports a wider number of printers, including 9- and 24-pin Epson and IBM dot matrix models. Prices range from $195 to $395, depending on which printer drivers are included. Upgrades are available for $50. Xenographics Inc., 4 Executive Cir. #200, Irvine, CA 92714; 714/851-6352, 714/851-1314 (fax).

Reader service no. 682

Up Your Cash Flow 3.0

Version 3.0 of *Up Your Cash Flow* gives you a new set of ratios and a variety of predefined graphs to help you quickly grasp your company's financial position. Among the battery of new financial ratios in this fill-in-the-blanks forecasting package are debt to equity, net income to equity, inventory turnover, net income to sales, accounts-receivable turnover, accounts-payable turnover, and cash flow to current debt. Also new with version 3.0 of the program is a set of predesigned charts available at the touch of a key for graphing financial indicators such as sales, net income or loss, cash flow, and sales versus expenses. *Up Your Cash Flow* retails for $99 ($30 cheaper than its predecessor); upgrades are $25. Granville Publications Software, 10960 Wilshire Blvd. #826, Los Angeles, CA 90024; 800/873-7789, 213/478-6070 (fax).

Reader service no. 683

Great Plains Edition of Forest & Trees

The *Great Plains Edition of Forest & Trees* lets you easily tap key corporate data in *1-2-3, Excel, dBASE III* and *IV, R:base, Paradox,* and *DataEase* files, and then enables you to present it graphically. *Forest & Trees* works in the background and can be set to fetch data at predetermined times. Alarms can also be set to notify you should any critical data points, such as accounts receivables, drop below predetermined limits. *Great Plains Edition of Forest & Trees* retails for $795. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103; 800/456-0025.

Reader service no. 684

For more information about any product, contact the manufacturer or circle the number on the reader service card.

386SX NOTEBOOKS: PORTABLE

These seven tiny SX laptops offer blazing speed, gorgeous screens, and up to 80MB of hard disk capacity. The catch? Too little battery life for a cross-country flight.

TJ Byers

If you've put off buying one of the new featherweight notebook PCs because they're too slow, their screens too coarse, or their hard disks too small, you've just run out of excuses. The latest 386SX notebooks run every bit as fast as their desktop counterparts and boast surprising RAM and hard disk headroom. Yet they're no bigger—and a good deal lighter—than a ream of paper.

This amazing combination of power and portability is a real boon for those who run on-screen presentations or use *Windows 3.0* on a flight from San Francisco to Chicago. They're good news for anyone, in fact, who's become used to 386 speed at work and expects the same on the road.

In just a few short months, notebook PCs have evolved from 8086 systems with distorted CGA graphics to 386SX speedsters with impressive VGA displays and room for at least 4MB of RAM. Nor has light weight been traded for power: Notebooks are holding steady at between 6 and 9 pounds—including battery, hard disk, modem, and AC adapter/charger.

The one disappointment is battery life. Lightweight machines always have this problem, and the power-hungry SX CPU makes matters worse. Not one of these notebooks runs more than 3 hours on a single charge. That's much too short for a coast-to-coast flight unless you pack extra batteries or compromise performance by turning on power-saving features.

For your shopping pleasure, we've selected seven of the top 16-MHz and 20-MHz 386SX notebooks and put them to the test. Portability and battery life are still the most important buying issues, but performance varies widely enough that you should pay close attention to the benchmark results. And unless you plan to use your new SX notebook as a paperweight, a keyboard that's close to standard is essential. You'll want to look at RAM capacity, screen size, and price as well (see the sidebar "Buying Smart" for details).

With one exception (the 6.8-pound TI TravelMate 3000), all these systems weigh in between 8 and 8.5 pounds. Each boasts a bright monochrome VGA screen with a standard 1.3:1 aspect ratio and has a built-in 3½-inch floppy. And all turn in performance that's on a par with their 386SX desktop equivalents. Naturally, the two 20-MHz notebooks in this roundup (from Compaq and Texas Instruments) run circles around the five 16-MHz systems—and are priced accordingly.

Zeos's Notebook 386 is our Best Buy, thanks to its compelling combination of speed, above-average battery life, near-standard keyboard, and very low price. Two other systems come awfully close: Everex's Tempo LX (which is virtually identical to the Zeos, but a bit more expensive) and Compaq's faster—but pricier—LTE 386s/20.

As usual, we priced all the notebooks in the same *PC World* configuration: 4MB or 5MB of RAM, a 20MB hard disk, a built-in 1.44MB floppy drive, at least one parallel and one serial port, a 2400-bps internal modem, and DOS. Exceptions are noted in the individual reviews.

Bargain hounds, beware: These are not cheap sys-

POWERHOUSES

Zeos's Best Buy Notebook 386 combines a low price, a fast recharge time, an excellent display, and a fine keyboard.

STAN MUSILEK

tems. On average, these 4MB to 5MB SX machines cost about $2000 more than the 1MB 8086-based notebooks we reviewed in October 1990, although only about $750 more than 1MB 286-based systems. We think the extra performance and the ability to run 386-specific applications are worth the extra bucks.

ALR Venture 386SX

PROS: Low price, great keyboard

CONS: No internal modem, battery hard to change

With a street price of only $2955 in the *PC World* configuration (with 5MB of RAM, but no modem) the ALR Venture 386SX is the least expensive SX notebook reviewed. It boasts a superb keyboard and capable 16-MHz performance. This notebook won't hold an internal modem, though, and you need a screwdriver to change batteries—unfortunate, since battery life tops out at the usual stingy 2¼ hours.

Recharging the battery takes a while—the manual says 1 hour, but in informal tests, recharge time approached 3 hours. The charger lacks a charge-in-progress indicator, leaving you to guess when the battery is fully charged.

The keyboard is one of the best we've seen on a notebook PC. There are dedicated cursor keys in the standard inverted-T pattern and full-sized control keys, and the page control keys are dedicated too. Only the

Along with the lowest street price in the roundup, ALR's Venture 386SX boasts an outstanding keyboard. However, a small 8.4-inch screen and no internal modem are drawbacks.

STAN MUSILEK

Compaq's 20-MHz LTE 386s/20 runs away with performance honors, and you get a mouse port and a hefty RAM ceiling. But the keyboard isn't so hot, and the price is way high.

numeric keypad and <F11> and <F12> keys are emulated, forcing the user to press a second key at the same time.

The screen is the smallest of the lot, measuring only 8.4 inches diagonally. However, the image is sharp, you get 32 shades of gray, and you can change from normal to inverse video via a front-panel switch.

Technical support is good, even though you have to pay long-distance charges. Techies are available 9 hours a day. We called three times and got an immediate response on our first call; we left messages on the other two, and ALR got back to us within 20 minutes.

ALR's Venture 386SX has some problems, but they're not critical. Yes, it's hard to swap batteries, charging takes a while, and the screen is a little smaller than average—but none of these is a deal breaker. As for the missing internal modem, you can always plug a pocket modem into one of the two serial ports. So while the Venture 386SX misses a Best Buy, its rock-bottom price, good speed, and excellent keyboard make it quite appealing.

Compaq LTE 386s/20

PROS: Blazing speed, small size

CONS: Expensive, inferior keyboard

Compaq's 20-MHz LTE 386s/20 is far and away the fastest machine in the roundup and one of the smallest. It also delivers the longest battery life (2¾ hours) and the highest RAM capacity (10MB). These specs help explain its 8.4-pound heft and $6616 street price (in the *PC World* configuration, with a 30MB hard disk)—the highest price in this review.

The LTE 386s/20 has fine battery features—including the longest life in the roundup. Recharge takes only about an hour and a half, and it's easy to swap batteries.

Unlike previous LTE keyboards, this one has good feel, and the control keys

SX Power You Can Pack in Your Briefcase

Light weight and tiny footprints set these benchmark-bashing notebooks in a class by themselves. TI's TravelMate 3000 takes top honors for portability, but Zeos's Best Buy Notebook 386 and Everex's Tempo LX offer the best balance of features for the money.

● Yes
○ No

	ALR Venture 386SX	Compaq LTE 386s/20	Everex Tempo LX	Samsung NoteMaster 386s/16	TI TravelMate 3000	Twinhead SuperNote 386SX/16	Zeos Notebook 386
Standard features							
Street price[1]	$2955[2,3]	$6616[4]	$3248[2]	$3798[2]	$5038	$3450[5]	$3195[2]
List price[1]	$3694[2,3]	$8316[4]	$4328[2]	$5047[2]	$6997	$3993[5]	$3195[2]
CPU speed	8/16 MHz	8/20 MHz	8/16 MHz	8/16 MHz	8/10/20 MHz	8/16 MHz	8/16 MHz
80387SX caprocessor support	16 MHz	20 MHz	16 MHz	8/16 MHz	20 MHz	16 MHz	16 MHz
Portability							
Traveling weight (pounds)[6]	8.2	8.4	8.4	8.2	6.8	8.0	8.4
Size (inches)	12.2 x 8.6 x 2.1	11.1 x 8.8 x 2	12.2 x 10 x 2	11 x 8.5 x 2.2	11 x 8.8 x 1.8	11 x 8.6 x 2	12.2 x 10 x 2
Battery							
Battery life (hours/minutes)							
Power-saving enabled/disabled	2:30/2:16	4:04/2:41	4:13/2:35	2:00/2:04	3:13/2:00	2:10/2:00	4:13/2:35
Recharge time	3:00	1:26	1:02	4:12	4:15	2:20	1:02
Charger indicates charge in progress	○	●	●	●	●	○	●
Screen							
Size (square inches)	34	38	42	34	45	47	42
Shades of gray[7]	32	32	16	64	32	32	16
Keyboard							
Cursor keys in standard T	●	○	●	○	●	○	●
Dedicated page control keys	●	○	●	○	○	○	●
Dedicated function keys	●[8]	●[8]	●[8]	●[8]	●[8]	●[8]	●
Expandability							
RAM capacity	5MB	10MB	5MB	5MB	6MB	4MB	5MB
Internal modem option	○	●	●	●	●	○	●
Largest hard disk option	40MB	60MB	20MB	60MB	60MB	80MB	20MB
Mouse port	○	●	○	●	●	○	●
Expansion chassis available	○	●	○	○	○	○	●
Service and support							
Free on-site service	○	○[9]	○	○	○	○	●
Toll-free support number	○	○[9,10]	○	●	●	●	●
Daily support (hours)	9	○[9,10]	11	10	9	12	24
Weekend support	○	○[9]	○	○	○	○	●
Electronic BBS	●	○[9]	●	●	○	●	●
Fax	●	○[9]	●	●	●	●	●
							BEST BUY

[1] Standard configuration includes 4MB RAM, 2400-bps modem, 20MB hard disk, 1.44MB floppy drive, at least one parallel and one serial port, and DOS.
[2] Includes 5MB of RAM.
[3] Without modem.
[4] Includes 30MB hard disk.
[5] Includes 40MB hard disk.
[6] Including PC, battery, modem, and AC adapter.
[7] Including black and white.
[8] <F11> and <F12> simulated.
[9] Via dealer. Same variation will be found.
[10] Toll-free number available 12 hours daily for basic help only.

Buying Smart

If you're planning to pack your portable down airplane aisles or into clients' offices, there's no such thing as too light or too small. That's the whole notebook idea. But as notebooks increase in power, they need to be evaluated less as laptops and more as familiar desktop PCs.

PORTABILITY
Don't settle for anything heavier than 10 pounds "traveling weight"—the total for PC, battery, modem, and AC charger. Since the weightiest of these SX notebooks is a mere 8½ pounds, you can clearly beat our recommendation.

BATTERY
Ideally, you should demand at least 3 hours of life, but the best of these power-hungry SXs offers only 2¾ hours in full-featured mode. Recharge time of 1½ hours or less is another big plus—as is an indicator that lets you know when the recharge is complete.

SCREEN
All these notebooks deliver VGA graphics with a standard 1.3:1 aspect ratio (which means no egg-shaped circles). Screen sizes range from 34 to 47 square inches—the latter is about the equivalent of a 9-inch CRT. Look for the biggest screen you can afford, and with 16 or more shades of gray. The more gray shades your notebook can display, the better color graphics will look on the monochrome screen.

KEYBOARD
Emulated keys slow typing and increase errors. Look for dedicated cursor keys in the familiar inverted T, and dedicated page-control and function keys. As with any keyboard, responsive feel is important too.

PERFORMANCE
To take full advantage of 386-specific applications like *Windows 3.0*, you'll want a CPU speed of at least 16 MHz—but 20 MHz is better. Hard disk speed is nearly as important, so look for average access time of less than 23ms. Happily, all but one of these machines (the Twinhead) have it.

EXPANDABILITY
Most 386-specific applications need a lot of RAM. We consider a 4MB ceiling a reasonable amount, with 10MB none too much. You should also look for support for an internal modem so you don't have to pack one of those so-called pocket modems. A hard disk option of 60MB or bigger means you're equipped to run *Windows*. Finally, an expansion chassis lets you connect easily with a network or specialized peripherals when you're off the road.

SERVICE AND SUPPORT
To compare tech support, we made three blind calls to each vendor, asking a fairly technical question, and noted the time it took to get an answer. Compaq owners must go through their local dealer—with quality of support varying from one location to another.

PRICE
We base our cost comparisons on *street price*. For every machine (except those, like the Zeos, that are sold direct), we call as many as five PC dealers in each of eight cities (Boston, New York, Atlanta, Chicago, Dallas, Houston, San Francisco, and Los Angeles) and ask for a quote in the standard *PC World* configuration. Results are averaged.

Because the systems in this roundup are so new, we were able to get reliable street or direct-sale prices only for Compaq, Everex, and Zeos machines. We estimated street prices for the remaining systems by applying the discounts offered by dealers on similar products from the same manufacturer to the new machines' list prices. —*TJB*

are nice and large. But the page keys are still emulated, and the cursor keys remain in a maddening L-shaped layout. The screen is relatively small (38 square inches), but its image quality is excellent, with 32 shades of gray to help render colors in monochrome. Switching from text to graphics, however, may require careful adjustment.

Service is handled via Compaq's network of dealers. Reader surveys indicate that most users rate Compaq's support quality very highly, but of course service will vary from one dealer to the next. Compaq has recently added a central, toll-free number, but it will answer only very basic questions.

Compaq's LTE 386s/20 is clearly aimed at users whose needs are above average. Performance is outstanding, the 10MB RAM ceiling is 4MB higher than the nearest competitor's, there's a mouse port, and options include a 60MB hard disk and a $1499 docking station. While the LTE's 8.4-pound weight, nonstandard keyboard, and premium price keep it out of the winner's circle, it's

probably the machine to buy if you plan to multitask more than four memory-hungry *Windows* applications.

Everex Tempo LX

PROS: Low price, fabulous screen

CONS: Relatively bulky

At a street price of $3248 in the *PC World* configuration (with 5MB of RAM), Everex's 16-MHz Tempo LX is pleasantly inexpensive. Battery life is above average, performance is good, and the system comes with a great screen and a decent keyboard. But at 8.4 pounds and 244 cubic inches, it's also one of the heaviest and largest notebooks in this lightweight company.

The Tempo will run for 2 hours and 35 minutes on one charge, tying with the Zeos Notebook 386 for second-longest battery life. Moreover, it ties for the fastest recharge time in the roundup: only 1 hour.

The large screen measures 9½ inches diagonally and displays the sharpest, crispest LCD monochrome VGA image we've seen. However, like the Compaq, it requires careful adjustment when you're switching from text to graphics. It delivers 32 shades of gray, but only in the rarely used, low-resolution MCGA mode. In most cases, 16 shades is all you'll get.

The keyboard is better than most. Its feel is good, the dedicated cursor keys lie in the standard inverted T, and page keys are dedicated too. A few control keys are located oddly.

Technical support is quite good—although it requires a toll call. Technicians are on duty 11 hours a day, and all three of our queries were handled immediately.

The Everex Tempo LX has three strong selling points: a reasonably low price, a good screen, and a lightning recharge time. These highlights are dimmed somewhat by the notebook's size and weight, but it's still a reasonable choice.

If you buy Everex's inexpensive Tempo LX, you'll get good performance—plus a screen that's a pleasure to use. Moreover, recharge time is exceptionally fast.

At only 6.8 pounds, the 20-MHz TravelMate 3000 from Texas Instruments is portability champ, and its screen is big and bright. But there are keyboard and battery problems.

STAN MUSILEK

Death of the Desktop

The new generation of SX notebooks is making existing laptops virtually obsolete. Will these systems replace your desktop PC as well? Not quite yet. But they're getting closer than anyone could have guessed even a year ago.

Engineers still need to beat three major technical obstacles: lack of color, relatively low-capacity hard disks, and limited expansion options.

A solution to the color problem is almost here. Gorgeous, lightweight, LCD color screens are already available on several AC-powered laptops, and most engineers think it won't be more than two years before these units can lower their power consumption to where they'll run on battery power. Of course the price (currently about $2000 extra) will need to drop too.

Likewise, large hard disks are simply a matter of time. Recently, 60MB hard disks in low-power, 2½-inch form factor have appeared. As soon as the state of the art reaches 120MB—probably within the year—this obstacle will evaporate.

Expansion boards are another matter. Aside from sockets for a modem and memory upgrade, a square millimeter of free space inside a notebook is tough to find. The solution? A "docking

station," which offers plenty of room for more mass storage, network boards, and other devices. Slip your notebook in one of these when you get back from the road, and you can hook into the office LAN or any other desk-bound device. Three of the notebooks in this roundup have a connector that's designed to slide into a docking station, although only Compaq is currently shipping the station.

The desktop isn't dead quite yet. But once the color problem is solved, you may have a tough time justifying buying one machine for the road and another for your desk. —*TJB*

Samsung NoteMaster 386S/16

PROS: Mouse port, free copy of Windows

CONS: Short battery life, inferior keyboard

Samsung's midpriced 16-MHz NoteMaster 386S/16 has little to recommend it aside from a free copy of *Windows 3.0* and the mouse port to go with that program. For a $3798 street price (in the *PC World* configuration, with 5MB of RAM), you get a relatively heavy machine with one of the smallest screens, shortest battery lives, and longest recharge times in the roundup. The keyboard is jinxed by a nonstandard layout and too many emulated keys.

Battery life is one of the NoteMaster's biggest problems. You'll start seeing low-battery warnings after approximately 2 hours, and it takes 4¼ hours to recharge fully. The AC charger jack is located inconveniently behind a nail-breaking snap cover.

The keyboard could be a lot better, too. The cursor keys are in a nonstandard configuration, and page control keys are emulated. The 34-square-inch screen ties for the smallest in the review, and while it claims 64 shades of gray—the largest number in the roundup—they're available only in text modes (where they won't do you much good).

The technical support number is toll-free and operates 10 hours a day, and support quality seems good. Our calls were returned by a Samsung technician in 7 to 17 minutes.

The NoteMaster 386S/16N is certainly usable. But its small screen, short battery life, nonstandard keyboard, and long recharge cycle suggest you can do a lot better.

Texas Instruments TravelMate 3000

PROS: Fast, outstanding portability

CONS: Expensive, poor keyboard, short battery life

At a mere 6.8 pounds, Texas Instruments' TravelMate 3000 is by far the lightest and smallest machine in the roundup—and its fast 20-MHz CPU makes it second only to Compaq's LTE 386s/20 in performance. Moreover, it boasts a comfortable 6MB RAM ceiling. Unfortunately, the rest of the story isn't so rosy: The keyboard needs an overhaul, battery life ties for the worst in the roundup, and recharging is slow and unusually troublesome. And a $5038 street price (in the *PC World* configuration) makes this one pricey package.

Typical battery life is only 2 hours—and recharging takes well over 4 hours. Worse yet, when you're finished charging the battery, it has to cool off for 30 minutes before you can use it! Your only defense will be a stockpile of charged batteries.

As for the keyboard, the touch is mushy, and sometimes you have to hit the keys hard to make contact. Page keys are emulated, and the function keys are so small, they're mere slivers of their former selves. And you may find

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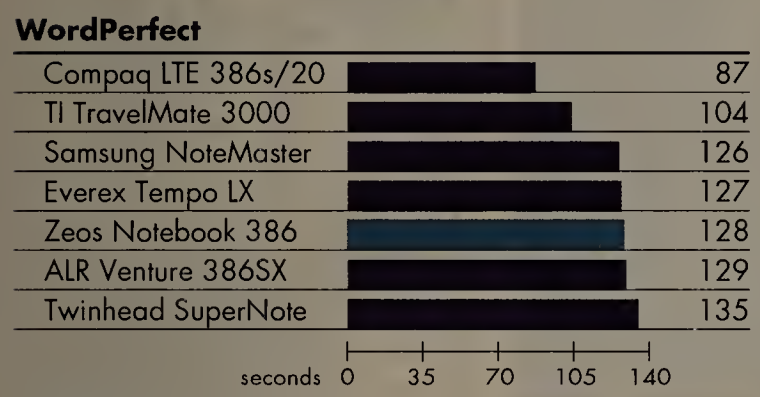
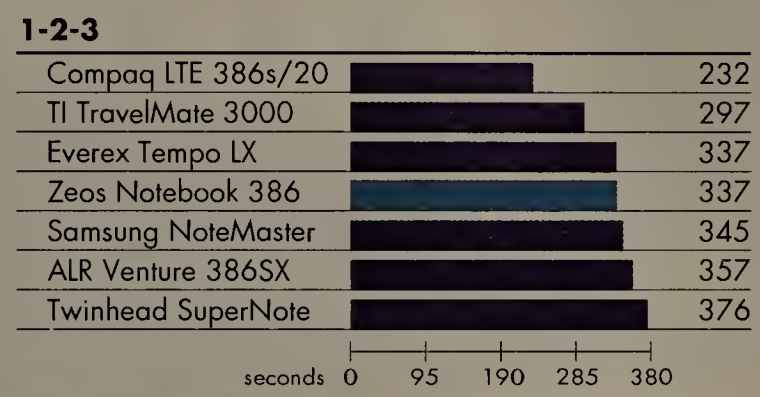
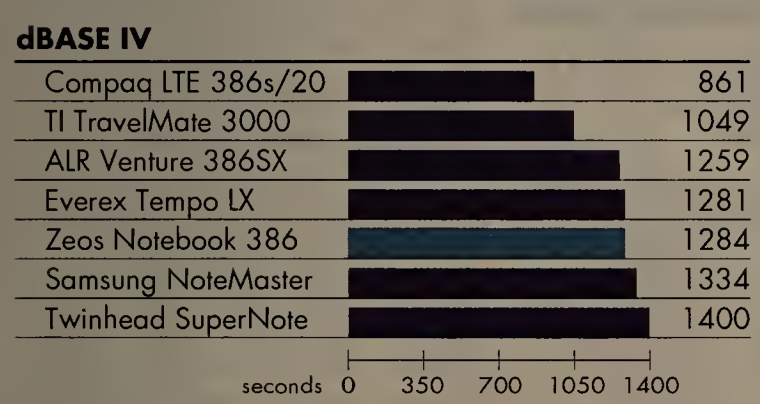
Notebook Players Put On a Desktop Performance

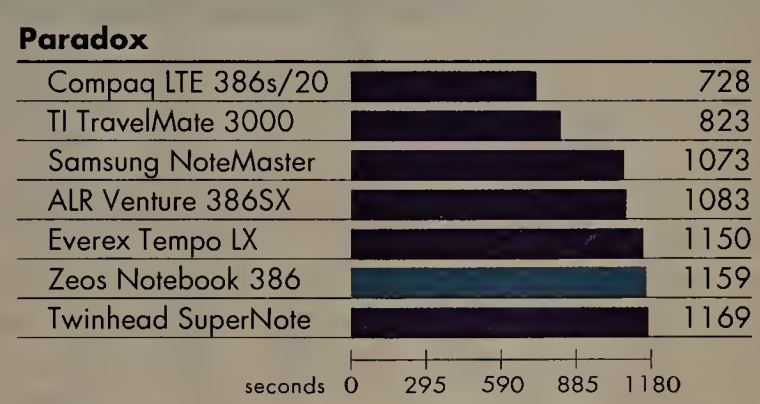
With this much power, who needs a desktop PC? These seven SX notebooks eat bread-and-butter business applications for breakfast. Not surprisingly, the 20-MHz units from Compaq and Texas Instruments beat the 16-MHz pack handily, with Compaq's unit taking a long lead. In the 16-MHz field, none of the entrants emerged a clear winner.

Best Buy









Methodology
The ALR Venture 386SX, the Somsung NoteMoster 386S/16, the Everex Tempo LX, and the Zeos Notebook 386 were tested with 1MB of RAM; the Texas Instruments TravelMate 3000 and the Twinheod SuperNote 386SX/16, with 2MB; ond the Compaq LTE 386s/20, with 3MB. Becouse eoch test wos designed to run in 640K of RAM, memory size should hove no effect on the benchmorks, with the exception of the *Porodox* test. The ALR, the Everex, the Samsung, ond the Zeos were tested with a 20MB hord disk; the Twinhead, with a 40MB hord disk; and the Texas Instruments, with a 60MB hard disk. Eoch computer was tested with the vendor's version of DOS.

WordPerfect
The time is meosured to reformat three *WordPerfect 5.1* documents that vary in size from 5K to 55K. The files are bosic text with some boldfoce ond underlined text; one of the documents includes o TIFF imoge.

dBASE IV 1.1
With the coching feoture disobled, the time is meosured to complete on unindexed seorch for o single record in o 100,000-record ports toble. Then the toble is indexed, the tronsoction processing module is run, and 600 records are posted.

1-2-3
In the *1-2-3 2.2* test, the time is measured to complete the following operations: The applicotion is looded. Then three separote worksheets (orithmetic, financial, and scientific) are loaded, ond various changes are made and recalcs run on eoch. Subsequently, the *MAPS* odd-in from Manogement Advisory Services is used to run o number of financiol forecasts.

Paradox 3.5
Starting with on orders table, eoch record is compared with on ovoiloble stock toble where the current price for items ore found, and the resulting record is inserted into on invoice table. *Paradox* detects and uses extended RAM, so the more RAM a system has, the better it performs.

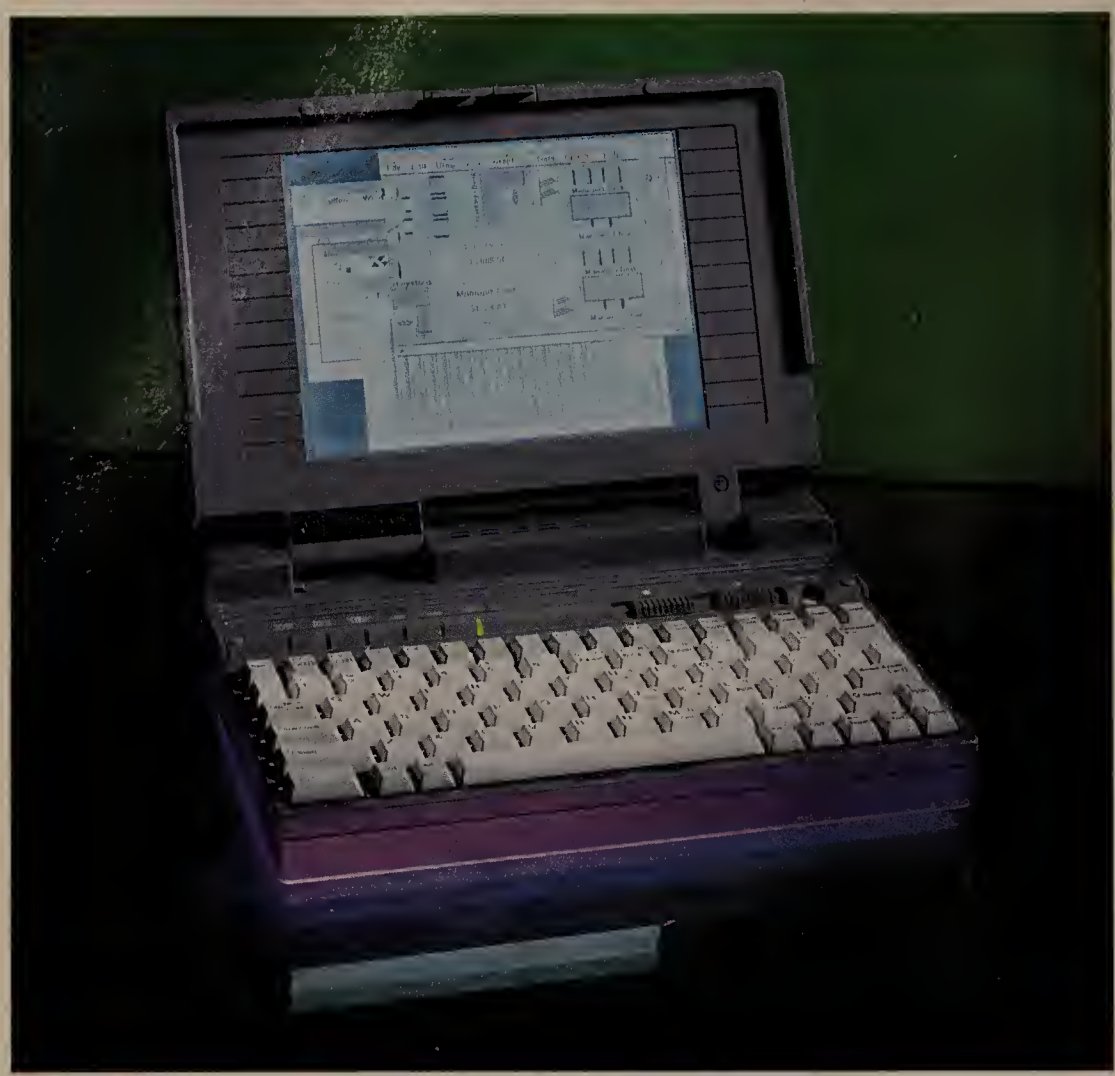
Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

yourself accidentally hitting the oversized <Shift> key instead of the dinky <Enter> key. At least the cursor keys are in a standard inverted T.

On the bright side, the TM 3000 comes with a 45-square-inch screen that's close to the largest in the roundup, and it supports 32 shades of gray. Image quality is excellent, and the controls are conveniently located at the right of the screen, along with a normal/inverse video switch.

TI's technical support number is toll free, but you'll have to leave a message. However, each of our three calls was returned within 20 minutes. Nor was the technician satisfied with leaving a message on our answering machine: He made repeated calls until he got us on the line live.

The TravelMate 3000 could have



Twinhead's SuperNote 386SX/16 is quite inexpensive, not to mention very light and small. And its screen is the biggest in the roundup. But performance is slow, and there's no modem.

been the perfect traveling companion. Its light weight, small size, large screen, fleet performance, and outstanding technical support are very appealing. There's even a built-in mouse port. Unfortunately, serious problems with its battery and keyboard prevent us from recommending this notebook—especially given its high price.

Twinhead SuperNote 386SX/16

PROS: Inexpensive, large screen, 80MB hard disk option

CONS: Slow, poor battery life

Twinhead's 8-pound SuperNote 386SX/16 notebook runs only $3450 on the street (in the *PC World* configuration)—one of the lowest prices in the roundup—and it's also one of the smallest and lightest machines here. Moreover, it comes with the biggest screen of any SX notebook we've seen and offers an 80MB hard disk option. But that's where the good news ends. The SuperNote 386SX/16 is the slowest system in the roundup, its battery life ties for the shortest, its 4MB RAM ceiling is the lowest, and its nonstandard keyboard layout resembles the Compaq LTE's.

More battery blues: Not only does power run out after a brief 2 hours, but the low-battery signal starts beeping annoyingly after *1* hour. And at 2¼ hours, battery recharge time is only average.

The keyboard has a good feel, but page keys are emulated, and the cursor keys are arranged in the L-shaped "Compaq-style" layout. At 47 square inches the screen is quite large, and colors are rendered in 32 tones of gray. There is no room for an internal modem, but Twinhead does sell a pocket modem that you can connect to either of the two serial ports.

Technical support is excellent: toll free, and available 12 hours a day. All three of our queries were answered immediately.

A rock-bottom price, a big, crisp screen, and solid phone support are good—but not good enough to recommend the Twinhead SuperNote 386SX/16. In this highly competitive market, last-place performance, short battery life, a quirky keyboard, and a missing modem don't add up to a smart buy.

Zeos Notebook 386

BEST BUY

PROS: Low price, terrific screen, good keyboard

CONS: Relatively bulky

At $3195 (in the standard *PC World* configuration, with 5MB of RAM), the Zeos Notebook 386 is one of the least expensive SX notebooks on the street. Moreover, except for a few cosmetic differences and a street price that's $53 lower, it's identical to the Everex Tempo LX. That means this 16-MHz, 8.4-pound system is large and heavy for a featherweight, but it delivers good speed, an excellent display, better-than-average battery life, and a good keyboard—all at a very low price.

The only significant differences between the Zeos and the Everex lie in the layout of the keyboard—and most of those changes are improvements. Unlike on the Everex keyboard, all the control keys are where they belong, and all 12 function keys are dedicated. The only regrettable modification is the emulated page controls.

Technical support is second to none, with toll-free, 24-hour, 7-day-a-week telephone help. Every one of our three calls was answered immediately by a live person, even at very odd hours.

While 8.4 pounds is relatively hefty for this roundup, it's still amazingly light compared to the best laptops of even a year ago. No other notebook here offers as tempting a combination of decent performance, excellent screen quality, good keyboard, quick recharge, and an internal modem—all at a very attractive price. This may not be the *perfect* portable, but it's a perfect mix of trade-offs, and a worthy Best Buy.

(continues)

STAN MUSILEK

"THE MOST POWERFUL COMPUTERS ARE THE ONES PEOPLE ACTUALLY USE."

—Apple Computer

First off, let's get one thing straight. We totally agree with Apple.* A truly powerful computer is measured in how often it's used.

IF YOU LISTEN TO APPLE, THIS IS THE MOST POWERFUL COMPUTER IN THE WORLD.

But while Apple has taken great strides in making the personal computer more useful, we've gone substantially farther.

Introducing the T2000SX notebook computer.

Quite simply, the T2000 SX is a more useful personal computer because it allows you to work how you want to work. When you want to work. And where you want to work.

Painstakingly engineered with you clearly in mind, the T2000SX will help you work more efficiently than ever before.

Virtually every feature you can find on a desktop computer, you will

Our technologically superior battery can be fully recharged in a mere ninety minutes.

find on the T2000SX: An 80386™SX processor with a math coprocessor socket, VGA compatible display, 1 MB (expandable to 9MB) of 70 nsec RAM, a 40 MB hard disk with 19 msec access time and 1.5 MB/sec data transfer rate.

The T2000SX has a 40MB hard disk with 19 msec access time.

But more important than the specs themselves, is the way the T2000SX lets you use them. Which is more often.

Our fluorescent side-lit screen provides even distribution of light. (Actual size.)

Welcome to the next generation in personal computing.

Because the T2000SX can fit easily into a briefcase (it weighs a scant 6.9 pounds), you can take it anywhere you go and use it in more ways than you can imagine.

Need to make revisions to a

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Our internal AutoResume back up battery automatically saves your work if your main battery runs out.

business proposal? The T2000SX gives you the freedom to do it from a train. The client wants an estimate on costs? You can give it to him right then and there—wherever there is.

No more wasting time running back to the office. Because the office is always with you.

But just in case there's something

Our user-installed memory card allows you to add up to 8 MB of memory yourself.

back at the office you still need, you can get back to it with our optional built-in modem. Which supports industry standard error correction and data compression (CCITT V.42, V.42bis, MNP® 5 and 10). It even supports cellular data communications via our optional smart cable adapter.

The T2000SX also has a unique feature you won't find on any other computer in the world. It is called AutoResume.

AutoResume: Think of it as a bookmark for your computer.

AutoResume automatically saves whatever you're working on whenever you turn the computer off. And it lets you go directly to the program you were using last when you're ready to start up again. So you don't have to reboot, restart your application and reload your files.

AutoResume also helps save on battery life and it allows you to change batteries without losing an ounce of information.

The T2000SX comes complete with Hypertext on-line documentation.

As for batteries, the T2000SX touts the latest in battery technology—Nickel Hydride. Nickel Hydride delivers 22% more watt-hours per pound than NiCad and it doesn't suffer from memory effect.

In keeping with the Toshiba tradition, the T2000SX also offers superior ergonomics. Like full-size, standard-spaced keys on a keyboard which has a full set of 12 dedicated function and 8 cursor control keys. And a VGA compatible, reversible black on white or white on black high resolution display.

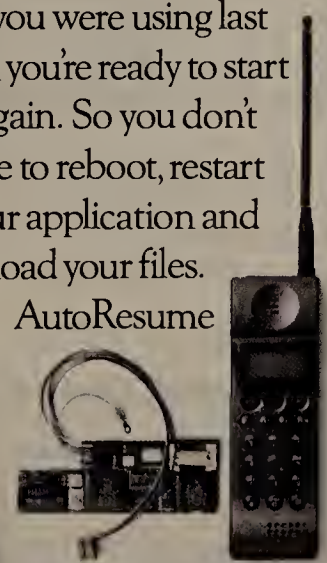
Okay, let's wrap this thing up.

These are just a few of the reasons why we believe the T2000SX is the most useful, and therefore, most powerful computer in the world. And why P.C. Week* Labs said, *"the T2000SX offers performance comparable to the LTE 386s/20, plus many of the design features that have made Toshiba a market leader in portable PCs."* PC WEEK

If you'd like to learn more about the T2000SX or any of our other portable computers, call us at **1-800-457-7777.**

In closing, we'd like to thank you for reading our ad.

We'd also like to thank our friends at Apple for giving us such a wonderful endorsement.



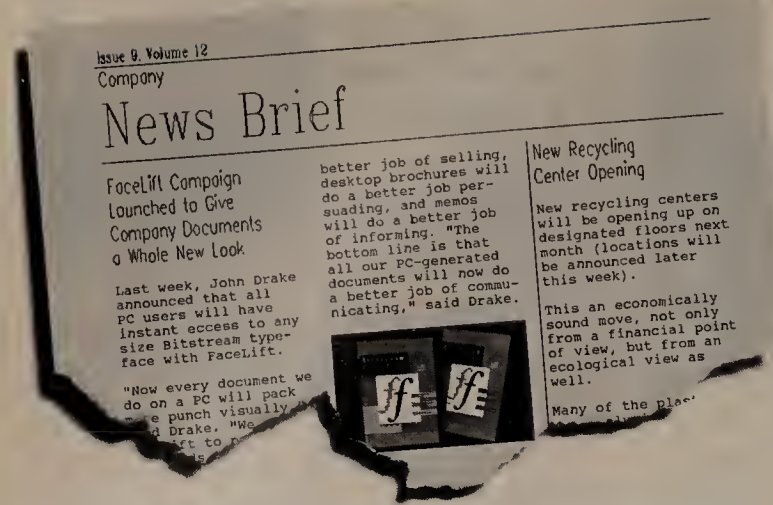
The T2000SX has an optional modem that allows data communications via a cellular phone.

TOSHIBA

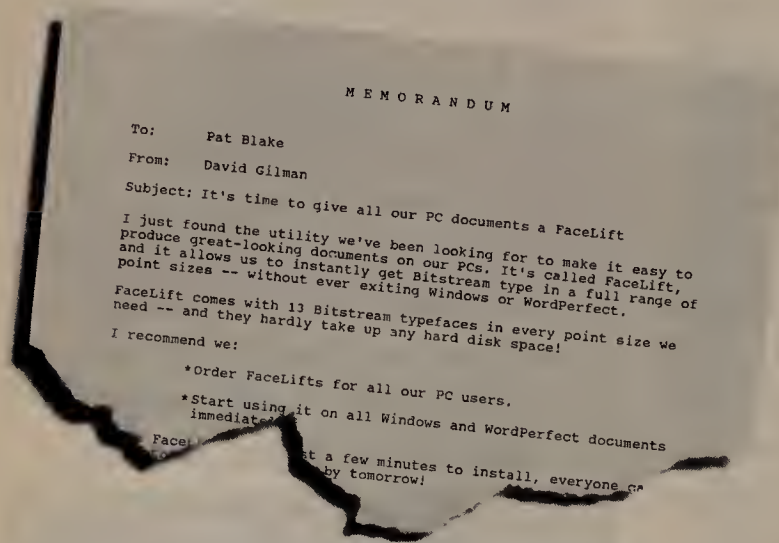
In Touch with Tomorrow.

Circle 257 on reader service card

Before

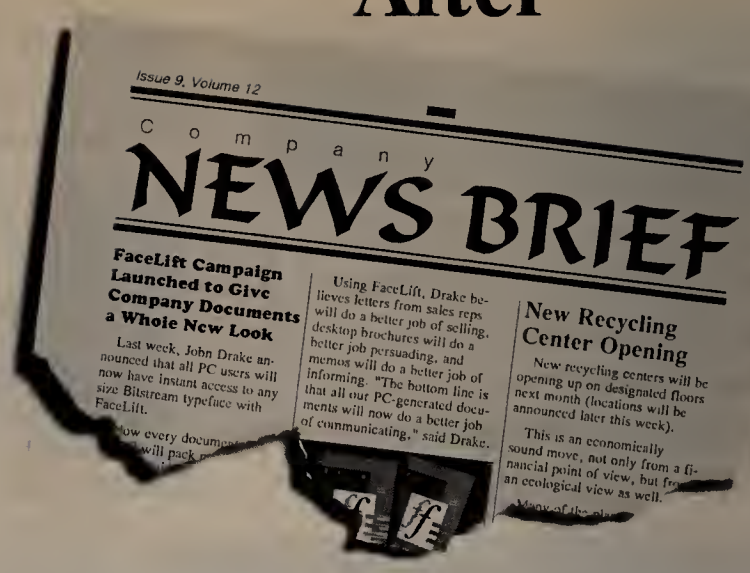


Until now, many desktop publishers found it too time-consuming to use the right typefaces and point sizes. Unfortunately, the end result was often too plain-looking for potential readers.

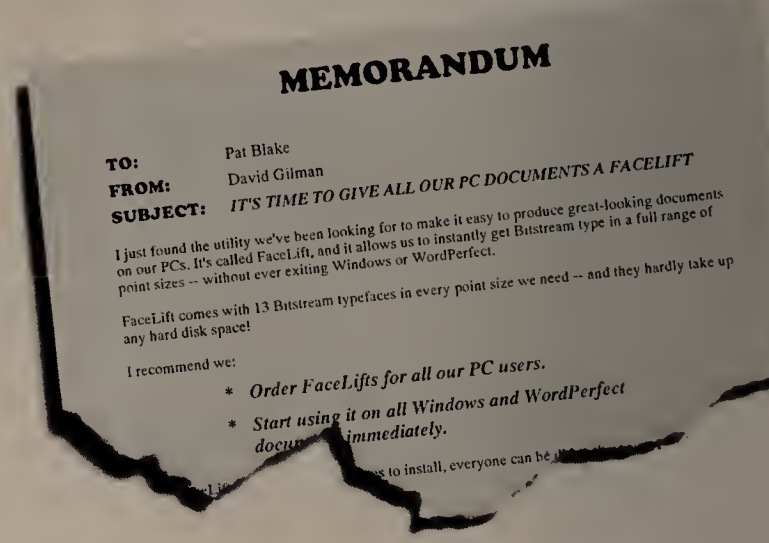


This memo, using one face in one size, looks fairly decent. But why settle for "fairly decent" when FaceLift will instantly make your Windows or WordPerfect documents look "absolutely great!"

After



FaceLift will instantly give you faces and point sizes to create great-looking documents that make you look like a desktop publishing pro. FaceLift comes with 13 Bitstream typefaces.



You'll install FaceLift in about 10 minutes. Then in seconds, get the typefaces and point sizes you need to make a perfect impression.

Bitstream introduces the Instant FaceLift for your Windows or WordPerfect documents.

Now make all your Windows™ or WordPerfect® documents great-looking in seconds with FaceLift.™

New FaceLift instantly gives you any size Bitstream® typeface–without exiting your software. And without consuming your hard disk space.

With FaceLift for Windows, instantly get Bitstream type in 2-127 point sizes. Get true WYSIWYG *(what you see is what you get)*, to see what your masterpiece will look like before printing. Then print on any printer that works with Microsoft® Windows.

With FaceLift for WordPerfect 5.1 or 5.0, just press "Ctrl-F8" and get Bitstream type in 2-500 point sizes. (No bitmaps needed!) Print on Hewlett-Packard® LaserJet® printers, HP DeskJets® and today's popular dot matrix printers.

FaceLift comes with 13 top quality Bitstream scalable typefaces, including:

Swiss™ 721 Roman
Swiss 721 Italic
Swiss 721 Bold
Swiss 721 Bold Italic

Dutch™ 801 Roman
Dutch 801 Italic
Dutch 801 Bold
Dutch 801 Bold Italic

Monospace 821

Bitstream Cooper Black

Formal Script 421

Park Avenue™

Brush Script

FaceLift and 13 Bitstream scalable typefaces (with four headlines faces) cost only $99 (suggested retail). For the best deal, add the Companion Value Pack with 24 more Bitstream typefaces for only $199 (suggested retail).

For more information, see your local dealer, or call:

1-800-522-FONT, ext.1600

FaceLift for Windows

FaceLift for WordPerfect

Bitstream

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Circle 25 on reader service card

EXECUTIVE SUMMARY

Tiny Laptops With a Desktop-Size Punch

Zeos's Notebook 386 earns a Best Buy thanks to a low price, fine support, and a solid set of features.

Would you consider using one of these featherweight, battery-powered SX notebooks as your only PC? Consider the facts: They're as fast as SXs that sit on a desk. They hold big hard disks and plenty of memory. All you lose are color displays and the ability to hold standard boards and drives.

Our Best Buy—the **Zeos Notebook 386**—boasts a great price, good battery life, fast recharge time, an excellent VGA display, and solid 16-MHz performance. Second place goes to the **Everex Tempo LX,** which is virtually identical except for a price tag that's $53 higher. If you can afford it, Compaq's 20-MHz **LTE 386s/20** outperforms the lot. The only real disappointment with all these machines is battery life—unless you switch on debilitating power-saving features, none run much longer than 2½ hours on a full charge.

	ALR Venture 386SX	Compaq LTE 386s/20	Everex Tempo LX	Samsung NoteMaster 386s/16	TI TravelMate 3000	Twinhead SuperNote 386SX/16	Zeos Notebook 386
Portability	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Battery life	Foir	Good	Good	Poor	Poor	Poor	Good
Screen	Foir	Good	Excellent	Foir	Excellent	Excellent	Excellent
Keyboard	Excellent	Foir	Good	Foir	Poor	Foir	Good
Expandability	Foir	Excellent	Good	Good	Excellent	Foir	Good
Performance	Good	Excellent	Good	Good	Good	Foir	Good
Service and support	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent
Price	Excellent	Foir	Excellent	Good	Foir	Good	Excellent
Overall value	Good	Good	Good	Foir	Foir	Foir	Excellent
							BEST BUY
Reader service no.	603	604	605	606	607	608	609

How we rate notebook computers
We rate notebooks based on information in the Features Evaluation and the PC World Test Report, combined with our opinions of quality, reliability, and user benefit.

Portability rates size and traveling weight (including PC, battery, modem, and AC adapter). To receive an Excellent rating, a notebook must be under 300 cubic inches in size and have a traveling weight of less than 10 pounds.

Battery life also rates battery-charging features. We require at least 3 hours of battery life (with battery-saving options disabled) for an Excellent rating.

Screen groups ergonomic features that make staring at the PC for hours as pleasant as possible. To rate an Excellent, a notebook's screen must have VGA resolution, standard 1.3:1 aspect ratio, at least 16 shades of gray in graphics mode, and 40 square inches of screen area.

Keyboard covers features that make it easy to switch back and forth between a standard desktop keyboard and that of the notebook. Dedicated cursor, control, page, and function keys in the standard IBM 101-key keyboard layout, plus desktop-quality touch, will yield an Excellent rating.

Expandability combines the total amount of installable RAM, plus options like an internal modem, a large hard disk, an expansion chassis, and a mouse port. To earn an Excellent rating, the notebook must support at least 6MB of RAM, a 40MB hard disk option, and an internal modem.

Performance scores are calculated by comparing each notebook's test scores to those of the other notebooks and of a spectrum of 16-MHz 803B6SX desktop PCs. To earn an Excellent rating, a notebook must excel in at least three-quarters of the benchmarks.

Service and support includes the length of the warranty, quality of documentation, quality and availability of phone support, support hours, and other support services. A notebook with at least one year's full warranty, a toll-free tech support number, long support hours, and good support quality merits an Excellent rating.

Price refers to street price. An Excellent rating means a notebook's price is in the lowest third of the price range for this roundup.

Overall value takes into account all of the above criteria with emphasis on portability, battery life, keyboard, price, and speed.

Lightweight Leviathans

Poky, 8086-based, floppy-disk laptops weighing 25 pounds or more are things of the past. Today, lean, powerful, SX notebooks with capacious hard disks pack more power per pound than any PC you can buy.

The Best Buy in this fast company is Zeos's 16-MHz Notebook 386. It's not as fast as the Compaq or as cheap as the ALR—but it's the one to buy if you're looking for a balance between performance, fast recharge, sharp screen image, and a great price. And it's available via convenient mail order. The Everex Tempo LX is virtually identical but sells for $53 more on the street.

Users addicted to the power of 20-pound 386 luggables like Compaq's Portable III will find themselves right at home with the company's LTE 386s/20. This benchmark-burning little monster will handle just about anything you can throw at it. But watch out for the awk-

SX Notebooks: Too Hot to Handle

Notebooks are the hottest things in computing—so hot, we couldn't get our hands on some of the most promising new ones in time for review. Below you'll find the basic specs on 16 exciting SX prospects that missed our deadline but should be shipping by the time you read this. Based on price, specs, demos, instinct, and a weakness for sheer good looks, we've highlighted the notebooks that smell like surefire winners.

	List price[1]	CPU speed (MHz)	Size (inches)	RAM capacity (MB)	Largest hard disk (MB)
ACER 1120NX	n/a[2]	20	11 x 8 x 2	5	40
AST PREMIUM EXEC 386SX/20	$3582	20	11.4 x 9 x 2.3	8	60
CAF SUPERLITE 386SX	$2235[3]	20	12 x 11.1 x 2.2	5	60
COMMAX NT-386SX	n/a[2]	16	12 x 8.5 x 2	5	60
COMPUADD COMPANION SX	n/a[2]	20	11 x 8.5 x 1.8	6	40
DAUPHIN 500	$3945	20	11.7 x 8.3 x 2	8	60
DELL 320N	$4396[4]	20	11 x 8 x 2	5	60
EPSON NB3S	$5597	16	11.7 x 8.5 x 1.7	5	60
HYUNDAI SUPER-NB386SX	$4445[3]	20	11.9 x 8.4 x 2	5	40
IBM PS/2 MODEL L40 SX	$6968[5]	20	12.8 x 10.7 x 2.1	18	60
KRIS NSX-1	$3744[6]	16	11.9 x 8.5 x 2.1	5	60
LIBREX 386SX	$5594[7]	20	11 x 8.5 x 2	4	60
OLIVETTI NOTEBOOK S20	n/a[2]	20	11 x 8.3 x 2	6	60
QUEST 386SX NOTEBOOK	$4995[8]	16	11.7 x 8.3 x 2	8	60
TANDON NB/386SX	$3949[4]	20	11 x 8.7 x 2.1	16	60
TOSHIBA T2000SX	$6896	16	12.2 x 10 x 1.9	9	40

[1] Standard configuration includes 4MB RAM, 2400-bps modem, 20MB hard disk, flappy drive, and DOS.
[2] Price not available at press time.
[3] With 5MB RAM.
[4] With 30MB hard disk.
[5] Includes 60MB hard disk and fax capability.
[6] With 5MB RAM, Windows 3.0, and mouse.
[7] Includes fax capability.
[8] Includes 40MB hard disk, fax capability, and Windows 3.0.

WHERE TO BUY

Acer 1120NX
Acer America Corp.
401 Charcot Ave.
San Jose, CA 95131
408/922-0333
Reader service no. 690

AST Premium Exec 386SX/20
AST Research
16215 Alton Pkwy.
P.O. Box 19658
Irvine, CA 92713-9658
800/727-1278
Reader service no. 691

CAF SuperLite 386SX
CAF Technology, Inc.
600 S. Date Ave.
Alhambra, CA
91803-1410
818/289-8299
Reader service no. 692

Commax NT-386SX
Commax Technologies
2031 Concourse Dr.
San Jose, CA 95131
408/435-5000
Reader service no. 693

CompuAdd Companion SX
CompuAdd Corp.
12303 Technology Blvd.
Austin, TX 78727
800/627-1967
Reader service no. 694

Dauphin 500
Dauphin Technology
1125 E. St. Charles Rd.
Lombord, IL 60148
800/782-7922,
708/627-4004
Reader service no. 695

Dell 320N
Dell Computer Corp.
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/937-1470,
512/338-4400
Reader service no. 696

Epson NB3s
Epson America, Inc.
20770 Madrona Ave.
Torronce, CA
90509-2842
800/289-3776 (dealer locotor), 213/782-0770
Reader service no. 697

Hyundai Super-NB386SX
Hyundai Electronics America
166 Baypointe Pkwy.
San Jose, CA 95134
800/627-7978
Reader service no. 698

IBM PS/2 Model L40 SX
IBM
1133 Westchester Ave.
White Plains, NY 10604
800/426-2468
Reader service no. 699

Kris NSX-1
Kris Technologies
260 E. Grond Ave.
South San Francisco, CA
94080
800/282-5747
Reader service no. 700

Librex 386SX
Librex Computer Systems
1731 Technology Dr.
#700
Son Jose, CA 95110
800/248-4880
Reader service no. 701

Olivetti Notebook S20
Olivetti Office USA
765 U.S. Hwy. #202
P.O. Box 6945
Bridgewoter, NJ
08807-0945
800/527-2960,
908/526-8200
Reader service no. 702

Quest 386SX Notebook
Quest Computer Systems, Inc.
2500 Centrol Ave.
#200
Boulder, CO 80301
800/234-0844
Reader service no. 703

Tandon NB/386sx
Tandon Corp.
405 Science Dr.
Moorpork, CA 93021
800/800-8850
Reader service no. 704

Toshiba T2000SX
Toshibo Americo Information Systems, Inc.
Computer Systems Division
9740 Irvine Blvd.
Irvine, CA 92718
800/334-3445
Reader service no. 705

For more information about all products listed here, circle reader service no. 908.

ward keyboard and high price—they may cool your ardor.

The new generation of notebook PCs comes closer than ever to the visionary concept of the perfect personal computer: mainframe power in a self-contained, portable package. All that's missing are color, a wrist strap, and voice control. But at the rate things are going, you may not have long to wait.

TJ Byers is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 901.

WHERE TO BUY

ALR Venture 386SX
Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/581-9240 (fax)
LIST PRICE: Model 20 with 1MB RAM, 1.44MB floppy drive, 20MB hard disk, Digital Research DOS 5.0 $2795; Model 40 same as Model 20 but with 40MB hard disk $3295
ACCESSORIES: 1MB RAM $179, 4MB RAM $899; 16-MHz 80387SX coprocessor $699; carrying case $79
WARRANTY: one year parts and labor
EXTENDED WARRANTY: through dealer or Intel
TECHNICAL SUPPORT: toll number, M–F 8–5
OTHER SUPPORT: BBS, fax
Reader service no. 603

Compaq LTE 386s/20
Compaq Computer Corp.
P.O. Box 692000
Houston, TX
77269-2000
800/231-0900
LIST PRICE: Model 30 with 2MB RAM, 1.44MB floppy drive, 30MB hard disk $6499; Model 60 same as Model 30 but with 60MB hard disk $6999
ACCESSORIES: 1MB RAM $549, 4MB RAM $2199; 5¼- or 3½-inch external drive $275; 20-MHz 80387SX coprocessor $999; 2400-bps modem $599; enhanced keyboard $89; external numeric keypad $119; 60MB tape drive $799, 80MB/120MB tape drive $899; extra battery pack $169; automobile adapter $129; external battery charger $149; carrying case $89; external options adapter $89; desktop expansion base $1499; DOS 3.31 $120, DOS 4.01 $150, OS/2 $340
WARRANTY: one year parts and labor
EXTENDED WARRANTY: via dealer
TECHNICAL SUPPORT: toll-free number, M–F 7–7
OTHER SUPPORT: none
Reader service no. 604

Everex Tempo LX
Everex Systems, Inc.
48431 Milmont Dr.
Fremont, CA 94538
800/821-0806
LIST PRICE: with 1MB RAM, 1.44MB floppy drive, 20MB hard disk, carrying case, DOS 4.01 $2999; same as base model but with 3MB RAM $3499; same as base model but with 5MB RAM $3999
ACCESSORIES: 2MB RAM $569; 16-MHz 80387SX coprocessor $399; 2400-bps modem $329; extra battery pack $125
WARRANTY: one year parts and labor; 48-hour repair turnaround with free express shipping
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll number, M–F 6–5
OTHER SUPPORT: BBS, fax
Reader service no. 605

Samsung NoteMaster 386S/16
Samsung Information Systems America, Inc.
3655 N. First St.
San Jose, CA 95134
800/624-8999 ext. 851, 408/434-5653 (fax)
LIST PRICE: with 1MB RAM, 1.44MB floppy drive, 20MB hard disk, carrying case, Lap-Link III, Windows 3.0, GW BASIC, DOS 4.01 $3999; with 60MB hard disk $4499
ACCESSORIES: 1MB RAM $199, 4MB RAM $699; 2400-bps modem $349, 2400-bps modem with 9600-bps send-fax $499; mouse $99; external keypad $99; AC charger $199; extra battery pack $129; deluxe leather carrying case $199
WARRANTY: one year parts and labor
EXTENDED WARRANTY: through dealer
TECHNICAL SUPPORT: toll-free number, M–F 7–5
OTHER SUPPORT: BBS, fax
Reader service no. 606

Texas Instruments TravelMate 3000
Texas Instruments, Inc.
P.O. Box 202230
Austin, TX
78720-2230
800/527-3500
LIST PRICE: with 2MB RAM, 1.44MB floppy drive, 20MB hard disk, DOS 4.01 $5499; with 30MB hard disk $5799; with 40MB hard disk $5999; with 60MB hard disk $6499
ACCESSORIES: 2MB RAM $999; 20-MHz 80387SX coprocessor $999; 2400-bps modem with fax $499; external keypad $99; extra battery pack $129; carrying case $99
WARRANTY: one year parts and labor on-site $132, with overnight exchange $84
EXTENDED WARRANTY: mail-in $84 a year, carry-in $132 a year, overnight exchange $168 a year, on-site service $540 a year
TECHNICAL SUPPORT: toll-free number, M–F 8–5
OTHER SUPPORT: fax
Reader service no. 607

Twinhead SuperNote 386SX/16
Twinhead Corp.
1537 Centre Pointe Dr.
Milpitas, CA 95035
800/545-8946,
408/945-1080 (fax)
LIST PRICE: with 2MB RAM, 1.44MB floppy drive, 40MB hard disk, carrying case, DOS 4.01 $3495; same as base model but with 4MB RAM $3744
ACCESSORIES: 2MB RAM factory upgrade $249, 60MB hard disk factory upgrade $395, 80MB hard disk factory upgrade $595; numeric keypad $99; external 1.2MB floppy drive $269; pocket modem $239, ethernet modem $639; extra battery $129; automobile adapter $399; external battery charger $49
WARRANTY: one year parts and labor
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll-free number, M–F 6–6
OTHER SUPPORT: BBS, fax
Reader service no. 608

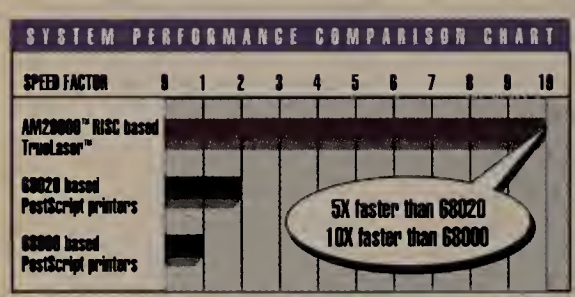
Zeos Notebook 386
Zeos Int'l, Ltd.
530 5th Ave. NW
St. Paul, MN 55112
800/423-5891,
612/633-1325 (fax)
LIST PRICE: with 1MB RAM, 1.44MB floppy drive, 20MB hard disk $2295; same as base model but with 3MB RAM, extra battery, external battery charger, carrying case, DOS 4.01 $2795; same as base model but with 5MB RAM, 2400-bps modem $3195
ACCESSORIES: 2MB RAM $349, 4MB RAM $649; 16-MHz 80387SX coprocessor $295; 2400-bps modem $219; extra battery pack $89; external battery charger stand $50; carrying case $79; DOS 4.01 $119
WARRANTY: one year parts and labor
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: toll-free number, 24 hours daily, 365 days a year
OTHER SUPPORT: BBS
Reader service no. 609

Microtek Introduces the TrueLaser Printer. Breakthrough Technology a a Breakthrough Price.

The New Price/Performance Printer Standard.

Microtek presents the TrueLaser™ printer. Powered by the AMD 29000, a 32-bit RISC processor that's five times faster than the 68020 found in most Postscript printers. And ten times faster than the 68000 found in PCL or PDL printers.

Right out of the box it gives you 2MB of memory. And it can be configured up to 6MB. It's both Adobe PostScript®™ and HP PCL compatible. Now that's unmatched power at an unmatched price.



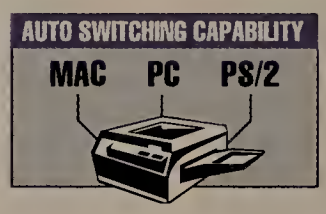
The First Laser Printer with TrueImage and TrueType.

The TrueLaser printer is the first printer to ship with TrueImage technology. It includes a bundle of 35 resident TrueType fonts. You also have a printer that's ready for both Windows 3.1 and Macintosh System 7.0. You have absolutely WYSIWYG font display. Faster screen display. And faster printing. That's versatile enough to suit all types.

RESIDENT APPLE
35
TRUETYPE FONTS

The Best of Both Worlds. Postscript and TrueImage.

In addition to TrueImage, the TrueLaser printer will also work with every member of your Adobe font library. It beautifully publishes Adobe PostScript®™ Type 1 and Type 3 fonts. It also accepts and prints documents from Macintosh, IBM PC and PS/2 machines via AppleTalk, Centronics and RS-232 interfaces. It's unique autoswitching capability makes the entire process transparent and invisible. It's perfect as both a stand alone printer or a shared network resource. So join the future without leaving the past.



All This for $2695. Call Today.

At $2695, you also receive a 1 year warranty with 6 month on-site service – a major breakthrough that you can't afford to miss.

Call **1-800-654-4160**, or in California, **213-321-2121** for the name of the authorized Microtek dealer nearest you.

And get a first hand look at the only printer that does it all - for a lot less.

The TrueLaser printer comes from Microtek, the leader in innovative scanning products.

MICROTEK

Better Images Through Innovation.

Microsoft *TrueImage*
Page Description Language

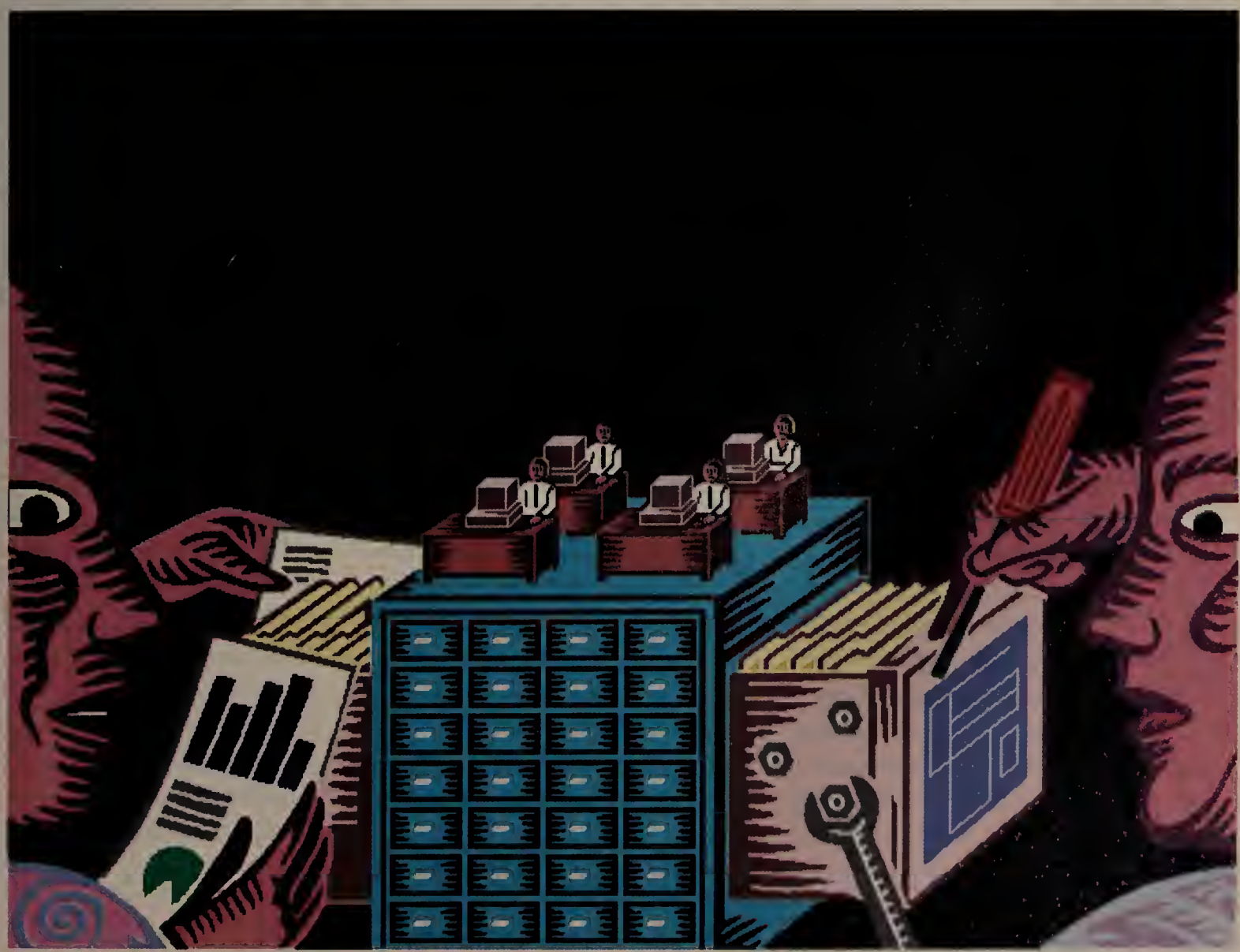
•**Microtek Lab, Inc.**, 680 Knox Street, Torrance, CA 90502, (213) 321-2121 (800) 654-4160. •**Microtek International Inc**, No. 6 Industry East Road 3, Science-Based Industrial Park, Hsinchu Taiwan, 30077, R.O.C., 886-35-772155 •**Microtek Electronics Europe, GmbH.**, Schießstraße 72, D-4000 Düsseldorf 11, F.R. Germany, 49-211-526070 • ©1990 Microtek Lab, Inc. All rights reserved. TrueLaser is a trademark of Microtek International, Inc. TrueImage, Windows and OS/2 are trademarks of Microsoft Corporation. TrueType, Macintosh and AppleTalk are trademarks of Apple Computer, Inc. IBM is a trademark of International Business Machines Corporation. PostScript is a trademark of Adobe Systems, Inc. Centronics is a trademark of Centronics Data Computer Corporation. All other trademarks or registered trademarks are the property of their respective holders.

Circle 164 on reader service card

Double-Duty Data Managers

With packages like Paradox and dBASE IV, you can extract just the data you need, while bulletproof data entry and reporting applications keep your work group humming. Discover which of the six top programmable data managers suits both you and your developer best.

Celeste Robinson



SCOTT BALDWIN

Buying Smart: Data Base Managers

When you shop for a data manager, the list of considerations is long and fairly complicated. Below, we've explained the key issues with as little jargon as possible, in order of importance for typical applications—but the ranking will vary depending on the job at hand.

EASE OF USE

Whether you're doing a once-only query or writing a huge application, you'll want a friendly interface. Look for clearly designed menu systems, uncluttered displays, on-line help, and good documentation. Programs that maintain a consistent interface no matter what activity you're engaged in help reduce training and support.

INTERACTIVE USE

A program needs more than just a pretty interface to be an effective interactive data manager. Even if you depend on programmed applications, you'll want the flexibility of ad hoc queries and on-the-fly reports. Look for competent tools for browsing, querying, entering, and editing data.

A spreadsheetlike table view for browsing data is a must—you should be able to display more than one table on screen at once. The best programs let you choose selected fields to display and let you display multiple table views whether the tables are related or not.

For finding information on the fly, you con't beat a query-by-example (QBE) facility. QBE lets you ask questions by simply checking off the fields you want and entering the criteria for your searches. Look for the ability to relate files on the fly as you create a query, so you're not limited to the fields and records defined in whatever form you happen to be working with at the time.

Also essential are file-level data validation rules, which control what type of data can be entered, such as multiple-choice text fields ("Mr.," "Mrs.," "Ms.," "Doctor") and ranges for number and data fields. All these programs let you validate in your applications, but only a DBMS with validation capabilities built into the data file structure can guarantee that the same rules apply whether you're entering data in a custom form, through an application, or on the fly.

Most users will want the ability to assign and save relationships with a file. Otherwise, you'll have to redefine the link every time you want to relate a particular set of tables.

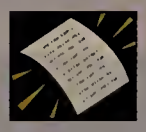
Other data entry features to look for include calculated fields (which automatically run a mathematical operation when you enter data) and auto-incrementing fields, used for consistently numbering orders and customers. Referential integrity—the automatic updating of linked values in related files—is required to prevent corrupting related information.

APPLICATION DEVELOPMENT

All the programs provide application generators that generate code based on existing forms and reports. You can rarely use an application generator to write all of a program's code, but it can save a lot of tedious coding when you write more complex programs.

Make sure the underlying language is robust. In addition to standard programming functions such as complete support for conditional statements and control structure commands, look for commands that make it easy to produce windows, menus, and other interface objects.

A good, interactive debugger is also important. This helps you catch errors by displaying code, application, and changing memory variables (temporary holding areas of RAM used to store data) on the same screen as you step through the code. Once you've written applications, you'll want to distribute them among your co-workers. You do this by means of a run time—a version of the DBMS that can be used only for running your applications. Purchasing a royalty-free run time lets you distribute applications freely.



FORMS AND REPORTS

As the gatekeepers for data entry input and printed output, forms and reports are crucial. All the programs offer form generators that let you freely paint the screen, moving fields where you want them. Look for one that lets you set relationships for data entry and editing from within the form (for example, allowing you to embed fields from more than one table). You will probably want a form generator that lets you view multiple detail records for a master record—for example, with the order header on top of the screen and the scrolling line items on the bottom.

For ease of use, a report writer should be band-oriented, providing separate sections of the screen for the top of the page, the beginning of the summary, records, the end of the summary, and so on. The more closely formatted elements resemble

the final printout, the fewer drafts you'll have to print to get the look you want. The report generator should also let you set up calculated fields (all the reviewed programs do) and define relationships without having to do a query first.

PERFORMANCE

The bigger your data base and user base, the more important performance becomes. See the PC World Test Report for the results of our benchmarks, and see "Five Problems in Search of a Data Base" to see which tests are more important to your applications.

MULTIUSER CAPABILITIES

All the programs work on a LAN, but some offer better multiuser controls. Automatic, hassle-free file and record locking are essential for networking. File locking places various levels of restriction on a file (table) to prevent loss of data or compromised data integrity. Record locking protects data by allowing only one user to change a particular record at a time. Most products provide several file-locking levels, from full locks (total lockout) down to prevent-write locks (others can look but can't touch).

The program should permit only one person at a time to edit a record but should enable other users to browse, query, or report on the same data at the same time. One problem most of the reviewed DBMS's share: They won't let two people add or save a new record in the same file simultaneously. —*C. R.*

Sometimes you really should demand the best of both worlds—especially if you're called upon to select your office's data base management package.

If your work group does heavy data entry, you'll want a programmable data manager that enables you or a developer to create custom multiuser applications. Perfect for standardized jobs like order entry, mailings, and inventory, custom applications protect your data base from errors while making it easy for employees to enter data and run preset reports.

On the other hand, managers and other authorized users need to be able to run ad hoc queries and reports unanticipated by a developer. For that you need a DBMS with good *interactive* features: flexible querying, forms design, and reporting tools, as well as a simple interface that's ready to use right out of the box. Otherwise, you may have to wait until the programmer arrives if you have a sudden desire to know the status of orders by region, overtime by department, or cash flow by quarter.

PC World compared six multiuser, relational data managers that claim to live in both worlds: powerful languages and development tools for work group applications and easy-to-use front ends for ad hoc manipulation. Only Borland's *Paradox 3.5* excels all around, winning a Best Buy for its superb combination of programming and interactive features.

Why You Need Programming

Not everyone needs a fully relational, multiuser, programmable DBMS. If your data base needs are simple, such as managing a list of contacts, you'll probably prefer a data manager without a programming language, like *Q&A* or *Professional File*—generally, they're cheaper and easier to use.

But aside from the inability to create more than simple applications, nonprogrammable data managers have other limits, usually in the area of relational and multiuser capabilities. Whereas the programs reviewed here are all flexible at relating data, letting you easily generate a query, form, or report from multiple files simultaneously, most nonprogrammables won't allow you to relate a record in one data table to many records in another. And whereas the DBMS's in this roundup offer roughly equivalent multiuser features, many nonprogrammables balk when more than one user tries to access the same file or record concurrently. The result is headaches as your needs change and your data base grows. (For a closer look at nonprogrammables and other data base alternatives, turn to our accompanying decision tree, "Know Your Options"; for a discussion of relational issues, see *Data Basics* in this issue.)

In evaluating these programs, we've considered six key buying issues: ease of use, interactive features, application development tools, report and data-entry-form generators, performance, and multiuser features. Because the importance of each criterion will vary according to your needs, we've laid out five common scenarios for using these programs (see the sidebar "Five Problems in Search of a Data Base"). Find the one that most closely parallels your situation, and use it as a guide to decide which DBMS best fills the bill. For more details on key buying issues, see "Buying Smart: Data Base Managers."

Advanced Revelation 2.03

PROS: Powerful form generator, file-level controls

CONS: Confusing user interface, no band-oriented report generator, slow queries

Born to help developers create sophisticated transaction-processing applications, *Advanced Revelation* adds a full set of interactive tools to its formidable programming language. Yet the interface is confusing, and some key development tools are missing. Other deficits include slow querying, an antiquated report writer, and a high price. Unless

FEATURES EVALUATION

Tools for Programmers—and Busy Managers

Programmers will probably find FoxPro, Paradox, and dBASE IV equally useful for building front ends. But when you want to extract just the data you need ad hoc, Paradox's intuitive querying takes top slot.

● Yes ○ No
◒ Deficient
n/a = not applicable
△ Limited only by available RAM

	Advanced Revelation 2.03	DataEase 4.24	dBASE IV 1.1	FoxPro 1.02	Paradox 3.5	R:base 3.1
Standard features						
Price						
1 user	$995	$795	$795	$795	$795	$795
5 users	$1690	$1890	$1790	$1095	$1790	$1790
25 users	$5165	$6270	$5770	$1095	$5770	$5770
Macros	●	○	●	●	●	●
Mouse support	●	○	○	●	●	●
Expanded memory support	●	●	◒[1]	●	●	●
Extended memory support	○	●	◒[1]	○	●	●
Directly access dBASE files	●	○	●	●[2]	●	●
Interactive use						
Relational table view	●	●	●	◒[3]	●	●
Nonrelated multiple table views	◒[4]	○	○	●	●	○
Query by example	◒[5]	◒[5]	●	○	●	●
Automatic updating across related tables	●	●	○	○	●	●
Customize table view	○	○	●	●	●	●
File structure capabilities						
Data entry validation	●	●	◒[6]	◒[6]	●	◒[7]
Calculated and auto-incrementing fields	●	●	○	○	●	●
Relational settings	●	●	○	○	●	●
Security restrictions	●	●	●	○	●	●
Large text fields[8]	●	●	●	●	●	●
Free-form fields[9]	●	○	○	●	●	○
Boolean (yes/no) fields	●	●	●	●	●	○
Date fields	●	●	●	●	●	●
Time fields	●	●	○	○	●	●
Relationships at one time	△	100	9	25	▲	△
Application development						
Application generator	●	●	●	●	●	●
Application in standard ASCII	●	○	●	●	●	●
					BEST BUY	

you're a professional developer who needs maximum programming flexibility in creating applications, *Advanced Revelation* is only a fair value.

In performance, *Advanced Revelation* is a mixed bag. It came in dead last in the multiuser gross-sales query test. However, it proved much faster in its strong suit—processing transactions.

Exploring the obscure menu structure is like wandering through a maze. Even a simple task like creating a data file is a mystery at first. Table views aren't configurable—you can't display just a few fields, for example—and you can't set relations from inside the QBE (query-by-example) facility. The file structure is a plus, however: Every field

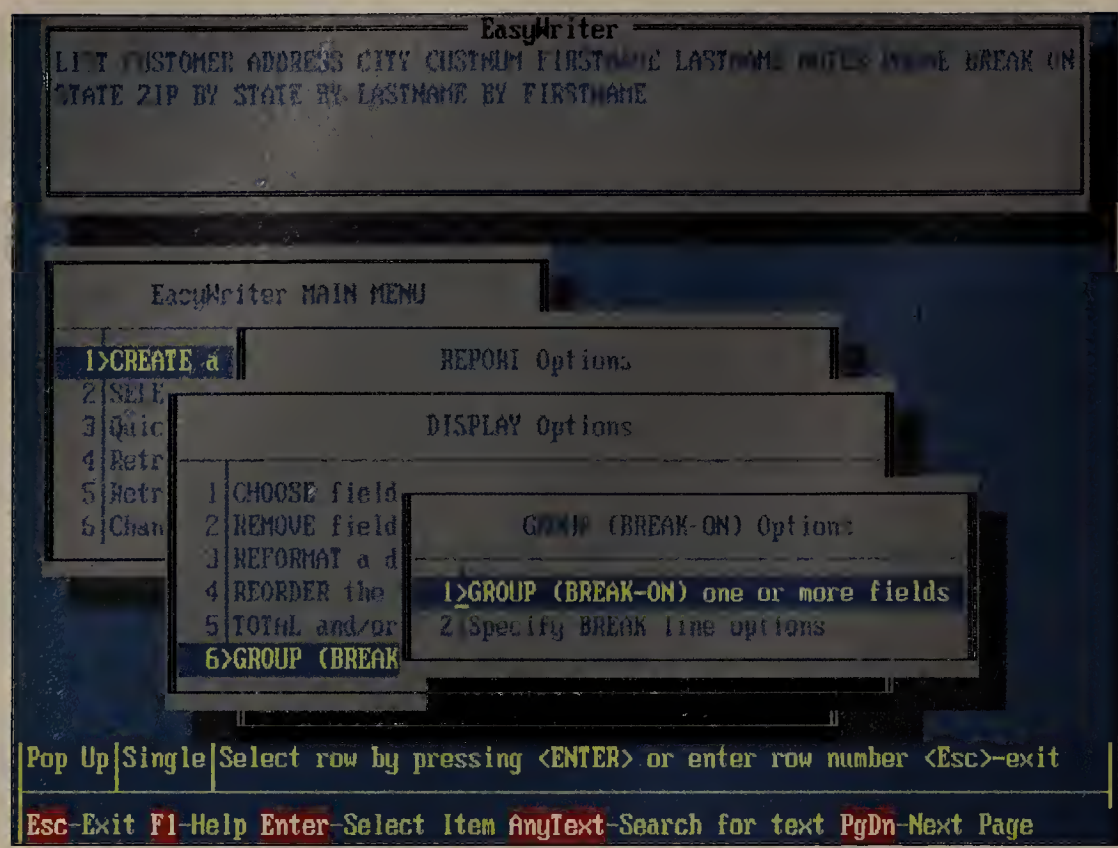
	Advanced Revelation 2.03	DataEase 4.24	dBASE IV 1.1	FoxPro 1.02	Paradox 3.5	R:base 3.1
Application development (contd.)						
Interactive debugger	◒[10]	○	●	●	●	○
Dynamic variable display	○	n/a	●	●	●	n/a
Displays code and results on same screen	○	n/a	○	●	●	n/a
Royalty-free run time available	○	●	●	●	●	●
Template language	○	◒[11]	●[12]	●	●	●
Form generator produces programmable code	○	○	●	●	●	○
Report generator produces programmable code	●	●	●	○	●	○
Forms and reports						
Screen-painting form generator	●	●	●	◒[13]	●	●
Color control in forms	●	◒[14]	●	●	●	●
Band-oriented report writer	○	●	●	●	●	●
Set relations in form generator	●	●	○	◒[15]	●	●
Set relations in report generator	●	●	◒[16]	●	●	◒[16]
Graphs	○	○	○	◒[12]	●	○
Cross-tabs	○	○	○	○	●	●
Multiuser capabilities						
Automatic record and file locking	●	●	●	●	●	●[17]
Multiuser data entry	●	●	●	●	●	●
Simultaneous entry	○	●	○	○	●	○
Concurrent edit and query/report on same file	●	●	●	●	◒[18]	●
Multiple queries on same file	●	●	●	●	●	●
Modify forms and reports while file in use	●	●	●	●	●	○
SQL servers supported[17]						
Microsoft SQL Server	●	●	○	○	●	○
Oracle Server	○	○	○	○	●	○
IBM Extended Edition	○	○	○	○	●	○
					BEST BUY	

[1] Data and overlay caching only.
[2] dBASE index files not supported.
[3] Must move between windows to see which records relate.
[4] Each table displays full screen.
[5] Limited to records related in one form.
[6] Validation at form rather than file level.
[7] Can't format data (auto-capitalization, filling in of dashes, and so on) at file level.
[8] Variable-length fields that can hold multiple paragraphs.
[9] Fields that can hold any type of data.
[10] Can't toggle between code and program.
[11] Templates for reports only.
[12] Extra-cost option.
[13] Programming required for relational forms.
[14] Limited to predefined color set.
[15] Limited relationships without programming.
[16] View must be created first to set relations.
[17] Concurrency control instead of record locking.
[18] Query restarts if file is changed.

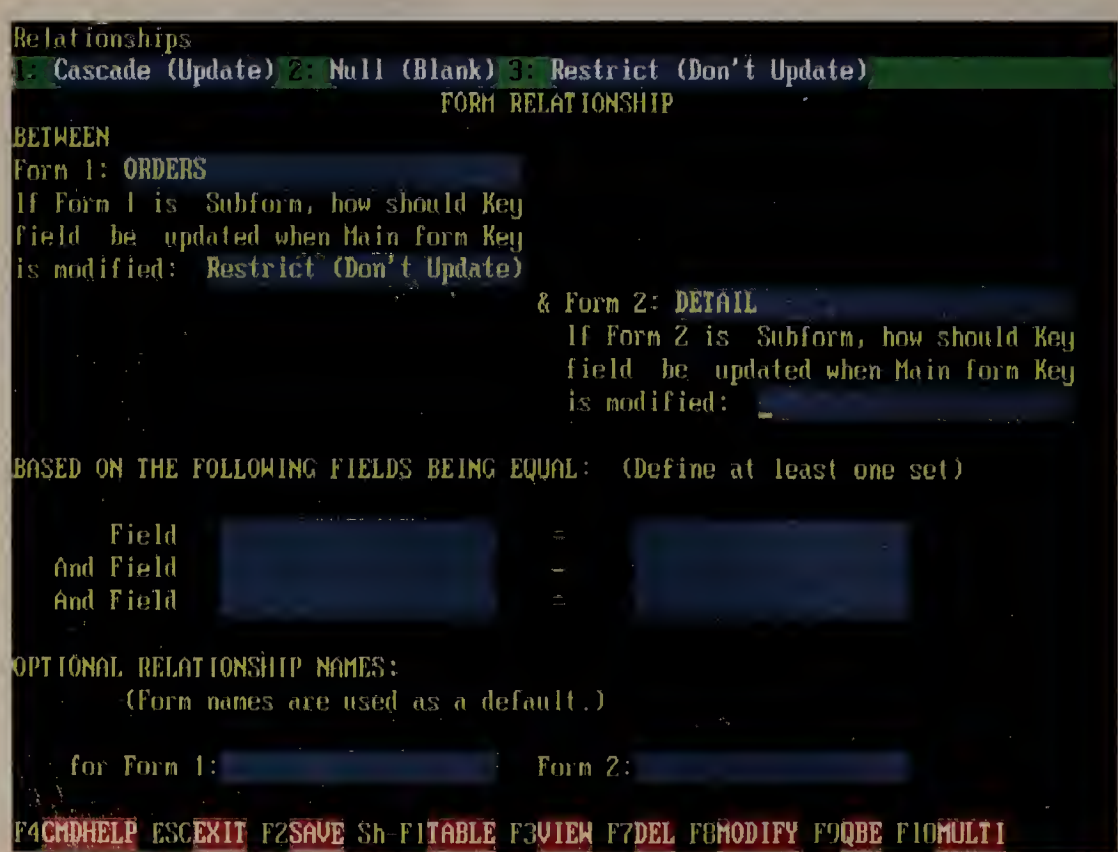
type and validation tool you'll need can be built directly into a file.

The form generator is first-class; you can even use it to create new files or hook your own programs into the fields. But the report writer is the only one in the roundup without a band orientation—you can create a variety of reports, but not easily.

Similar to BASIC, *Advanced Revelation*'s programming language is the most powerful (and difficult) of the bunch. Advanced programmers will enjoy the added flexibility of manipulating arrays to create a custom file format. And if you really want to get down and dirty, you can integrate C or assembler routines in your applications.



One of Advanced Revelation's report writers, Easy Writer, is feature rich, but it's confusing and lacks even the approximate view of the final result that a band-oriented designer offers.



DataEase guides you through the process of creating a complex relationship step by step, explaining each option clearly as you come to it.

Yet development tools are surprisingly deficient. The debugger won't let you view variables as they change or even toggle between your code and program. And while an *Advanced Revelation* run time is available, you can't—as you can with the other programs reviewed here—distribute unlimited copies of it with your applications.

Advanced Revelation is too knotty for interactive use or simple programming. Even professional programmers may be turned off by the slow query speed, poor debugger, and lack of a free run time. For most developers and nearly all managers, better options exist.

DataEase 4.24

PROS: Great forms, file-level controls, excellent multiuser capabilities

CONS: Difficult report generator, no debugger

DataEase is a friendly, competent DBMS with a top-notch form generator, but it still has some growing to do. Programmers will lament the lack of a debugger, LAN users will be disappointed by the slow multiuser queries, and just about everyone will struggle with the difficult report writer. But in the end great forms overcome all flaws—if your programming needs are modest, your data bases aren't too big, and multiuser access isn't too heavy.

Rather than bombard you with menus, *DataEase* walks you through the options a step at a time. This makes the program easy to learn but slows you down once you're accomplished, unless you type commands in directly via the advanced user interface.

It's easy to create forms, and with them data files. When you create a field, a dialog box pops up showing you every possible configuration option.

Querying is a breeze—you select records via a variety of criteria, and you can toggle freely between form and table views. *DataEase* makes relating data almost foolproof. You can link files using any field or group of fields that match in two forms.

The report writer has some serious flaws. You'll have to insert group or page footers into report formats manually, and placing detail items and summary fields precisely can be tricky. One nice touch: You can easily create a report that mimics your data-entry form.

DataEase's development environment is the most limited in the roundup. It's OK for creating simple applications without programming, and if you must program, *DataEase* prompts you through the process. The SQL-like language itself is suitable—as with *Paradox*, it's only slightly less powerful than its rivals—but *DataEase* doesn't in-

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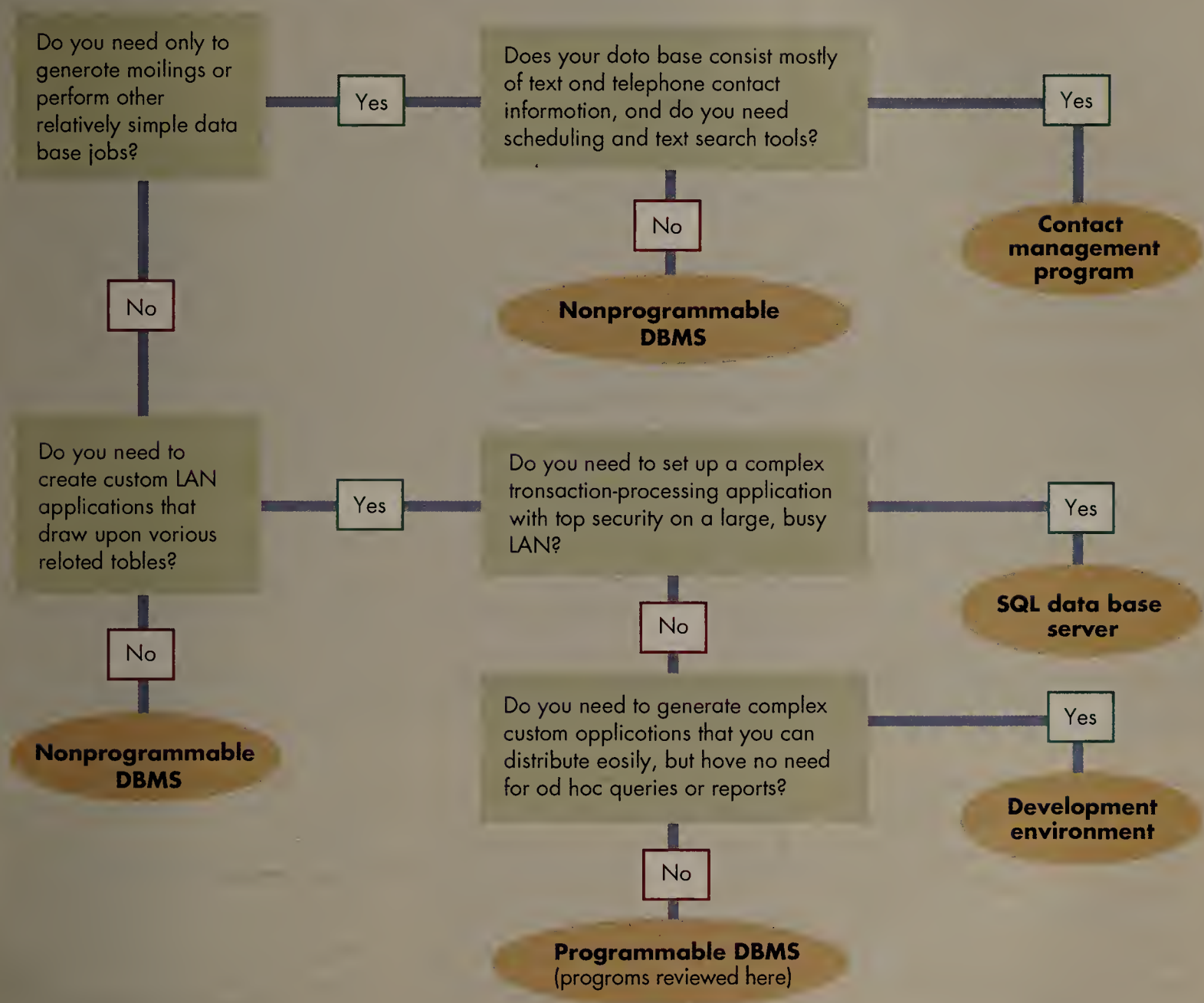
DBMS Alternatives

Is a programmable DBMS right for your situation, or would a nonprogrammable data base, a SQL server, or another alternative be a better fit?



Nonprogrammable DBMS. Designed primarily for single-user applications and mailing list data bases, programs such as *Q&A*, *Professional File*, and *PC-File* are semirelational, providing lookup tables to simulate many-to-one relations between tables. Others, such as *Alpha Four*, come close to the relational power of the programmable DBMS's reviewed here but lack tricks such as the ability to edit more than one table at a time.

No matter how relational the program, when your data base approaches a certain level of complexity, it will require programming. Some nonprogrammables offer menu-driven application generators that record and piece together forms and reports that you create interactively. These are fine for forging simple applications, but you'll need a true programming language for most business applications. Also, most nonprogrammables lack flexible file- and record-locking schemes, and many provide no network support.

Contact management program. Based on a data base core, contact managers are designed for sales professionals and others who need to keep track of phone contacts. They provide data entry forms with predefined and user-defined fields for taking notes on each call. Most include text search and scheduling modules, and some include time and billing and project planning features (see "Buyers' Guide: Contact Management Software," February 1991).

Development environment. If your applications are complex and you need to automate a dedicated function such as order processing rather than freely extract and manipulate data, consider a dedicated development tool like *Clipper* or *Clarion*. They lack user front ends for on-the-fly queries and reports, but they offer powerful programming languages and a full set of development tools. The main draw is an EXE compiler. Compared to the run-time versions offered by most DBMS's, compiled EXE programs use fewer files, consume less disk space, and usually run faster.

SQL data base server. If you're planning a large, complex transaction-processing application in which records are constantly updated and accessed by a horde of data entry clerks, consider a SQL data base server such as *SQL Server*. Such a program is better at handling simultaneous multiuser access than a standard DBMS (SQL servers are faster on a large, busy LAN) and has better security features, including transaction rollback, which, in the event of a crash, returns a data base to its previous status. You can use a variety of applications (including three of the DBMS's reviewed here) as front ends for querying the central SQL server. On the downside, even the best data base servers are difficult to install and maintain, and they require costly hardware to run properly.

Five Problems in Search of a Data Base

What are you using your data base manager for? These programs have a wide variety of uses, and the best solution for one office may be the worst for another. Here are five typical scenarios, along with the most relevant features and performance issues and the programs that fit the bill.

Shared Billing

1 **Scenario:** You and a few co-workers in a customer service or accounts payable department need to enter and look up customer billing information on a network. No one wants to learn programming, and hiring a consultant would exceed your budget. Everyone must be able to create queries and reports without interrupting data entry.
Key features: Relational table view, QBE, report generator
Key tests: Single-user queries
Recommendation: *R:base, DataEase, Paradox*

Group Research Analysis

2 **Scenario:** You're part of a group of researchers working on related science, academic, or market research projects, entering and analyzing a range of factors. Your work habits and data requirements vary, but you need access to each other's information. You also need the ability to create simple applications for your assistants.
Key features: QBE, graphics, form and report generators, application generator, data validation, cross-tabs
Key tests: Multiuser math-oriented query
Recommendation: *Paradox*

Sales Office

3 **Scenario:** Your sales department has a dozen or so people, all of whom enter leads in a common data base for generating mailings and individual action reports. Many of the sales representatives are computer novices, and they must be able to enter and search extensive notes.
Key features: Good programming environment, strong multiuser features, text file support
Key tests: Multiuser transactions
Recommendation: *FoxPro, dBASE IV*

Large-Scale Inventory/ Invoicing

4 **Scenario:** Your mail-order company needs a system to handle inventory, order taking, shipping, and billing. While all of these functions must be automated, managers need to be able to access the data freely for creative analysis. The volume of data entry is heavy.
Key features: Fast multiuser performance, first-rate multiuser capabilities, excellent programming environment, powerful QBE
Key tests: Multiuser transactions
Recommendation: No single product reviewed fits perfectly, so expect some compromises. Only *Advanced Revelation* provides the programming power to do this heavy transaction environment justice, yet it lacks the interactive tools managers require. Another possibility: a multi-application solution, perhaps built around a SQL data server (see "Know Your Options").

Large-Scale Integrated Accounting

5 **Scenario:** Your company needs a LAN-based accounting system that will be accessed by over 20 local employees. The system must also interact with branch offices, most of which use simple data managers that save data in the dBASE DBF file format.
Key features: Powerful programming language, direct dBASE-file access
Key tests: All multiuser tests
Recommendation: *FoxPro*

clude a debugger, so you'll have to try to catch mistakes as your application speeds by in real time.

When it comes to multiuser capabilities, *DataEase* is tops. It's one of only two reviewed DBMS's that allow two users to enter new records simultaneously in the same table.

If you want quick and easy—yet fully relational—forms and reports, and your programming needs are modest, *DataEase* is a good solution.

dBASE IV 1.1

PROS: Popular language and file structure, great QBE and report generator

CONS: Disorganized interface, no file-level controls

Like the proverbial camel, *dBASE IV* has the look of a program designed by committee—and the committee left out a few important humps. Despite a confusing interface and middling speed, however, *dBASE IV* has a lot going for it: top-notch form, report, and application generators; superb QBE; and an industry-standard language and file format.

dBASE IV 1.0 was slow, buggy, and memory hungry, but version 1.1 has answered most of those complaints. In addition to requiring less RAM than before and being as bug-free as its rivals, *dBASE IV* now ships with a special disk cache that speeds throughput. In most

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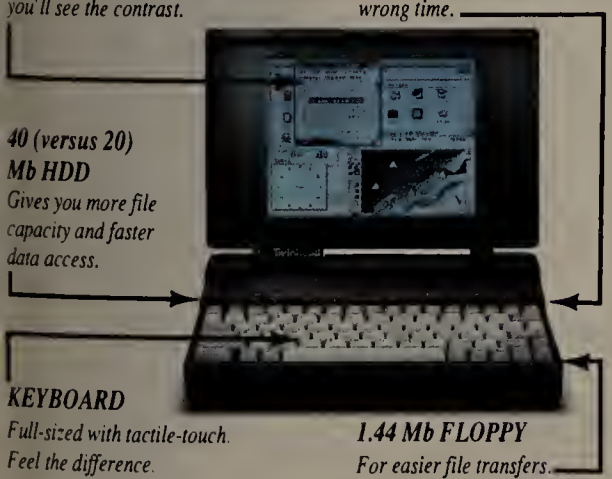

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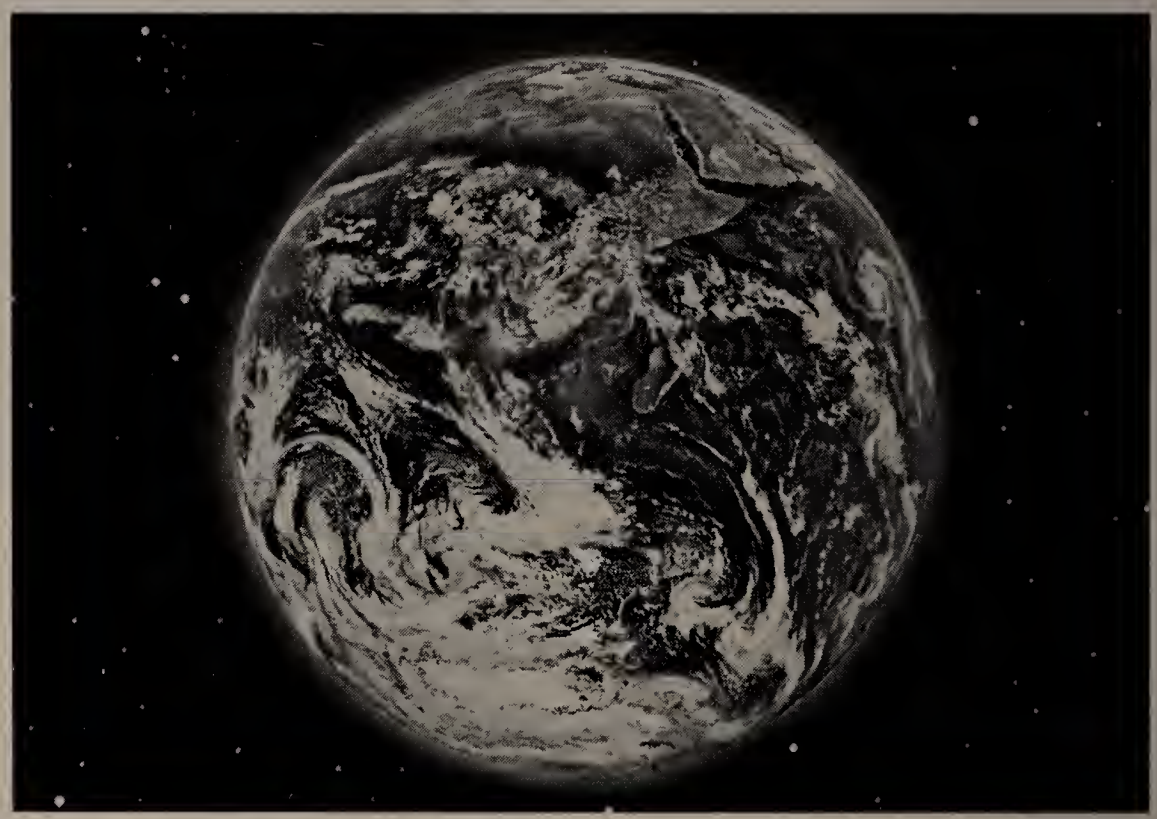

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tests, it performed reasonably well, but it was quite slow at transaction processing.

The program's menuing system is still cumbersome and confusing at times, with options popping up in menus where you'd least expect them. Most of the flaws in *dBASE IV*, however, pertain to the aging dBASE file format. There's no way to put data validation, calculations, relational settings, or just about any other specifics in a data file. Simply stated, unless you're the only user of a simple, single-file system, you shouldn't update a *dBASE IV* data base without going through a front-end application.

If you're just looking at data, *dBASE IV* is a jewel, with a versatile table view and a superb fully relational QBE that toggles easily between the table view and a topflight report generator. It's simple to report on related files, summarizing information and specifying complex calculations with a minimum of effort. The form and report generators both produce editable dBASE code, making reports easy to alter.

dBASE really shines as a programming environment. The application generator is versatile and the debugger quite good. And since the language and file formats are industry standards, they're well supported by third-party utilities.

If you need to enter or update data without having to create applications, look elsewhere. But *dBASE IV* makes querying a snap, and it's a good choice for application development.

The dBASE IV report generator offers many options for defining fields. Note the band-oriented detail beneath the pop-up dialog box.

FoxPro 1.02

PROS: Fastest in roundup, GUI-like interface, dBASE compatible

CONS: Nonrelational form generator, no QBE, no file-level controls

FoxPro leads the pack in three important areas: performance, development tools, and ease of use. In our benchmarks, *FoxPro* was the overall leader, excelling in the multiuser tests. *FoxPro*'s adherence to the dBASE file format and lack of QBE make it less useful for ad hoc data manipulation than *Paradox*, *dBASE IV*, or *R:base*, but if application development is your top priority, *FoxPro* is the best tool for the job.

The *FoxPro* interface is a smooth, text-based imitation of a graphical display, with pulldowns, pop-ups, adjustable windows, scroll bars, and the best mouse support in the roundup.

Hobbled by its dBASE file format, *FoxPro* lacks file-level data validation—you can add validation via programming, but you can't safely enter data directly if you bypass the application.

Still, some of *FoxPro*'s interactive features are excellent. You can set up your work environment by pointing and

Setting up FoxPro relations is easy. By pointing and clicking within the View window (upper left), you can create links between data displayed in other windows.

PC WORLD TEST REPORT

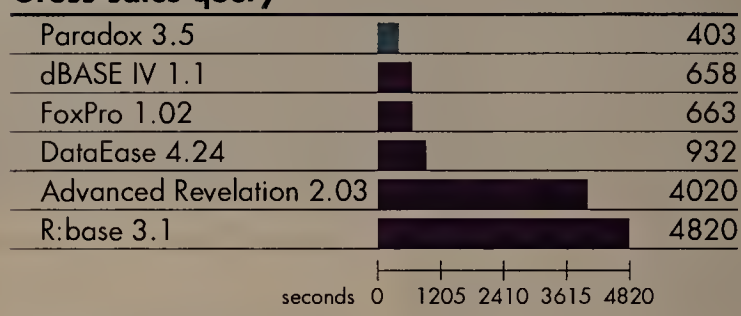
The Fox Wins the Race

FoxPro outperformed the other data base managers overall, with especially fleet performance in the multiuser tests. Best Buy Paradox, however, beat it in single-user queries.

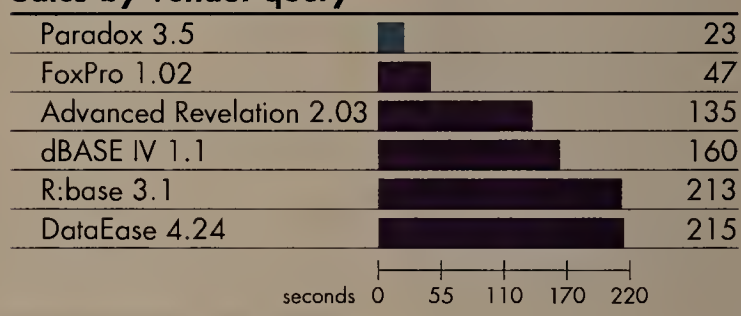
Best Buy

Single user

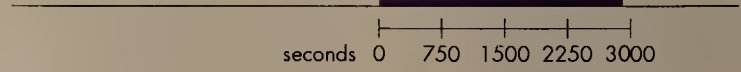
Gross-sales query



Sales-by-vendor query

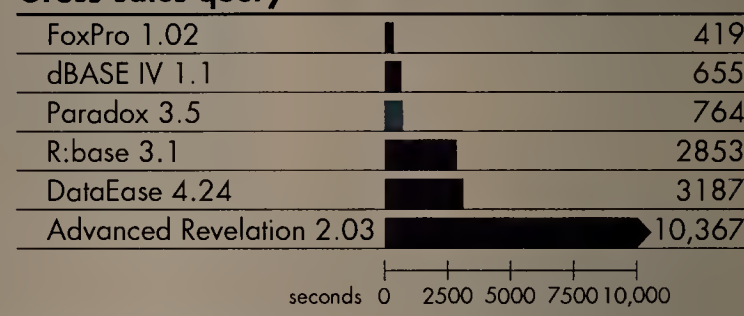


Transaction processing

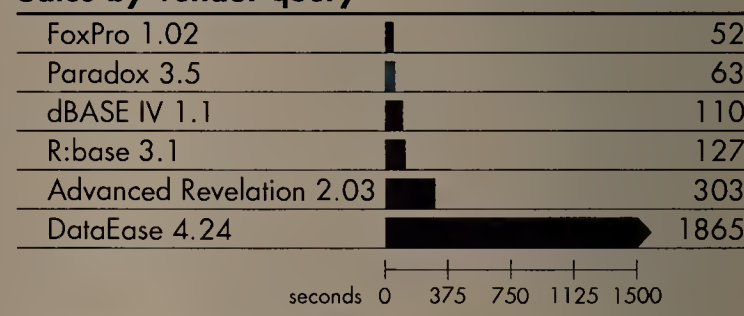


Multiuser

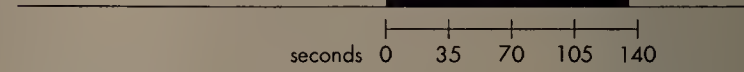
Gross-sales query



Sales-by-vendor query



Transaction processing



Methodology
All single-user tests were performed on a 20-MHz Compaq Deskpro 386/20e with 4MB RAM and a 110MB hard disk. Multiuser tests were performed using a Compaq Deskpro 386/25 server with 10MB RAM and a 300MB hard disk, ond 24 8-MHz 286 Eltech System 1800 PCs with 640K RAM and 20MB hard disks as workstations. To enhance performance and simulate normal use, we placed each user's private directory on the server. Six tables were created with each product: a 25-record salesperson table, a 1000-record customer table, a 25,000-record orders table, a 250,396-record parts-ordered table, a 2000-record parts table, and a 500-record vendor table. We assumed the existence of an imaginary seventh table for storing city, county, state, and ZIP code fields with a primary index on the ZIP code field. This action minimized duplication in the customer, orders, and vendor tables and made it necessary for each product to maintain secondary indexes on the linking ZIP code fields. We also created a 10,000-record transaction table to simulate a user performing data entry. This table was composed of customer information, shipping address, name of part ordered, and number of parts. Tables were linked by assigning each salesperson multiple customers, by having each customer place multiple orders, and by having each order composed of multiple parts. Each part ordered was linked to a parts table and a vendor. Single-user tests were run consecutively on a single PC. The multiuser queries were run simultaneously on separate workstations of a 3-station LAN. The multiuser transaction processing test was performed simultaneously on 12 workstations.

Gross-sales query
The data base is queried for a total of orders generated by all salespersons this year.

Sales-by-vendor query
The data base is queried for a list of orders this year that are tied to an individual vendor.

Transaction processing
One hundred transactions are processed with a 10-second delay between the end of each transaction and the start of the next. *dBASE IV 1.1*'s disk cache is enabled; its data integrity measure is not used. The result listed is the average time per transaction.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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* Based on US dollar market share of competitive models for the 12 months ending December, 1990, as reported by InfoCorp (1/91)

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clicking to open data files, set relations, and specify expressions for selecting records. These setups can be saved for future use, and you can view related files in multiple windows. But *FoxPro* is the only DBMS reviewed without a QBE facility. In its place, there's a tool for piecing together queries from dBASE commands—a paltry substitute.

The disappointing form generator is only partially relational—you'll have to program to get more than simple one-to-one relationships. Although it works with a mouse, it lacks the wonderful *FoxPro* interface. On the other hand, the report generator is fully relational and easy to use.

As a programming environment, *FoxPro* is unsurpassed. The program provides objects such as windows, dialog boxes, and scroll bars and lets you easily build them into your applications. The debugger is the best of the bunch. The application generator is the only weak point—it uses the same difficult interface as the form generator.

FoxPro is a great development environment and seems to be getting better. Version 2.0, promising better form and application generators, QBE, and a true EXE compiler, could be out by the time you read this.

Paradox 3.5

PROS: Excellent interface, strong QBE, flexible relational capabilities, fast

CONS: No long text fields, troublesome network data entry

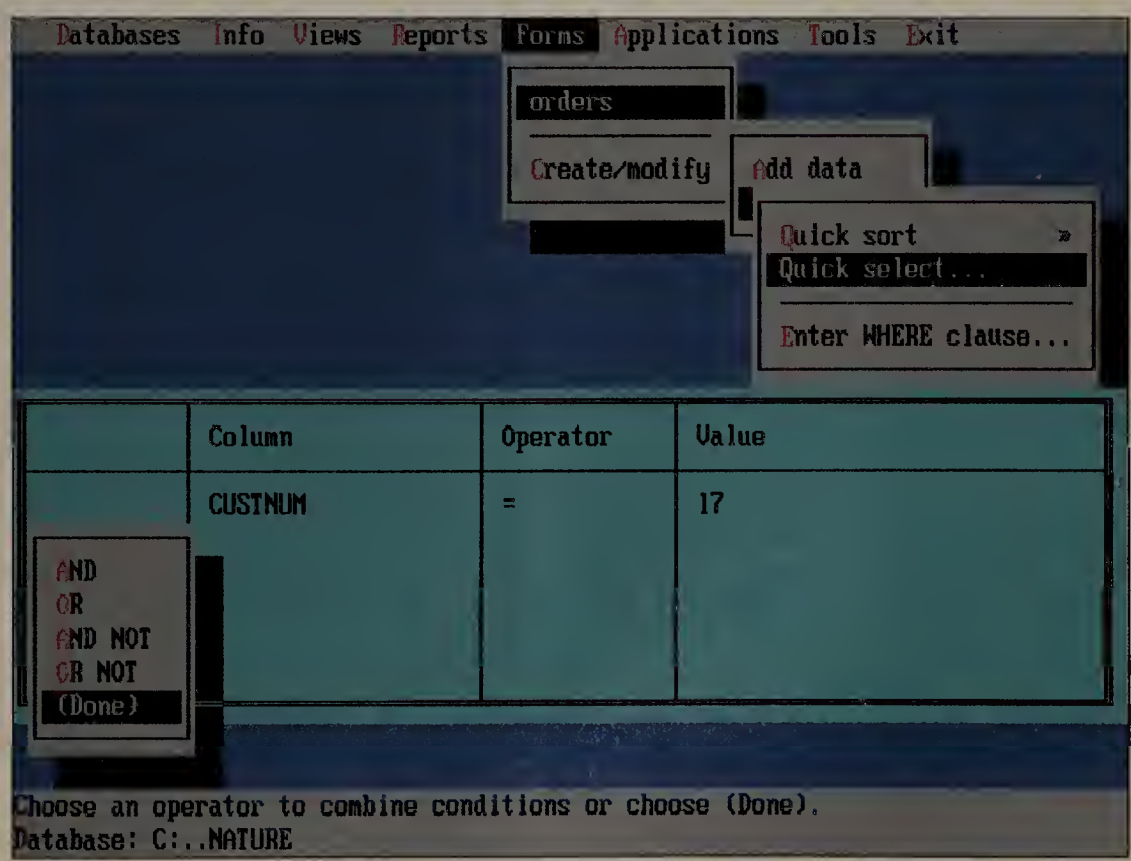
Whether you're writing applications or working with data directly, *Paradox* is powerful, flexible, and easy to use. It's also fast—a close second overall, it beat out even *FoxPro* in our single-user queries. Unless you demand full dBASE compatibility or plan on designing a complex transactional processing application, *Paradox* is your Best Buy.

Paradox's 1-2-3–like menus are logically organized. It's QBE was the model for its rivals, but none of them quite matches it. Along with searching and updating, you can compare entire groups of records against other groups.

Linking multiple files to a single form isn't quite as easy as in *DataEase*, but *Paradox* is the only program reviewed that lets you embed multiple *unrelated* tables. For example, in an order entry form, you could display a linked table showing line items and another showing customer info, and off to the side you could display a totally unrelated table, such as a parts table, as a reference.

Paradox has complete file-level data validation—in fact, you can even change the validation while editing interactively. But it's the only DBMS reviewed

Relating three tables, Paradox's query by example lets you easily calculate total hours and expenses for a specified project. Check marks indicate the fields to be displayed.



In addition to providing query by example, R:base lets you select records to view from inside the form module; it doesn't, however, show you the form as you make your selection.

EXECUTIVE SUMMARY

Paradox Is Tops for Queries and Programming

For a perfect balance of on-the-fly querying and painless application development, Paradox can't be beat.

These six data managers address two audiences: managers and other knowledge workers who need to extract data quickly and easily, and programmers who need a powerful language and development tools to create work-group applications.

Paradox takes Best Buy honors, thanks to its first-class querying, versatile table views and friendly, powerful development environment. You won't find a faster data manager for single-user queries. Coming in close behind are the speedy **FoxPro**—the fastest performer overall and the best development tool in the group—and **R:base,** with its superb application and report generators. **DataEase,** which features an easy form-driven interface and excellent multiuser support, and **dBASE IV,** another development pro, are also good buys.

	Advanced Revelation 2.03	DataEase 4.24	dBASE IV 1.1	FoxPro 1.02	Paradox 3.5	R:base 3.1
Ease of use	Poor	Good	Foir	Excellent	Excellent	Good
Interactive use	Good	Good	Foir	Foir	Excellent	Excellent
Application development	Foir	Foir	Excellent	Excellent	Excellent	Good
Forms and reports	Good	Good	Good	Foir	Good	Excellent
Performance	Foir	Foir	Foir	Excellent	Excellent	Foir
Multiuser capabilities	Good	Excellent	Good	Good	Good	Good
Overall value	Foir	Good	Good	Good	Excellent	Good
					BEST BUY	
Reader service no.	650	651	652	653	654	655

How we rate programmable data managers
We rate these programs based an information in the Features Evaluation and the PC World Test Report, combined with our opinions of the quality of the listed tools. Relational capabilities are considered in all categories in which they are pertinent.

Ease of use assesses how easy it is to work with the interactive and programming tools. An Excellent rating requires a logical, intuitive menu structure and a lack of major interface flaws. Extra points are given for good documentation and on-line help.

Interactive use evaluates how extensively you can enter, view, and manipulate data without creating applications or special forms. To receive an Excellent, a DBMS must provide a versatile, relational table view; a QBE facility that lets you create ad hoc relations; and the ability to control and restrict input at the data file level.

Application development considers the tools available for creating custom applications. An application generator, a good programming language, an interactive debugger, and a royalty-free run time are required for an Excellent rating.

Forms and reports looks at the tools available for setting up data entry screens and formatting and printing reports. To earn an Excellent rating, a DBMS must offer a screen-painting form generator and a band-oriented report writer that supports summary and calculated fields. Both should allow you to define relations and cut and paste text and fields freely.

Performance ratings are derived from standard deviation analysis of PC World Test Center benchmark results.

Multiuser capabilities rates how well these programs work on a network. To receive an Excellent rating, a data manager must have automatic record and file locking, allow simultaneous data entry and queries without lock conflicts, and permit you to modify forms and reports while a data file is in use. Extra credit is given for support of a major SQL server.

Overall value is averaged from all of the above criteria, with special emphasis placed on interactive use, application development, and forms and reports.

that doesn't support variable-length text fields, making it difficult to attach extensive notes.

The *Paradox* report writer is above average, letting you create calculated and summary fields without programming. You can set up relations easily, but you can't cut and paste freely between report bands, which makes design changes difficult. One unique plus: You can graph your data, using a variety of graph types. You can also create cross-tab reports to help you pull statistical trends from your data.

As a development environment, *Paradox* isn't as powerful as *FoxPro* but is a lot easier to use. The language is designed around *Paradox*'s interface, letting you ease into programming once you master interactive use.

Like *DataEase*, *Paradox* lets two users save new records simultaneously. But this plus is offset by a major multiuser flaw: If the data has been changed before a query is complete, *Paradox* restarts the query. Usually, this isn't a problem, but if data entry is a constant on your network, querying may take longer than expected.

With its polished interface and super query engine, *Paradox* makes it easier to get by without writing code than any other program reviewed. And the easy path from macros to full-fledged programming makes it tops for many development tasks. Unless you're working with large text blocks or expect multiple users to be entering data regularly during queries, *Paradox* is your Best Buy.

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Calendar: Scroll through the calendar to any date and press a key. There's your schedule.

Phonebook: Plenty of room to store not only phone numbers, but anything else important enough to remember.

AutoDial: Reminders doesn't just remember phone numbers, it'll even dial them for you.

Category: Organize everything from personal tasks to maintenance schedules using separate categories.

Log: Reminders lets you create a permanent record of all your past tasks and events.

Print: Anything Reminders displays on your screen can also be printed out for convenience.

Options: The Options feature lets you access on-line help, create data file backups, and fine tune the program.

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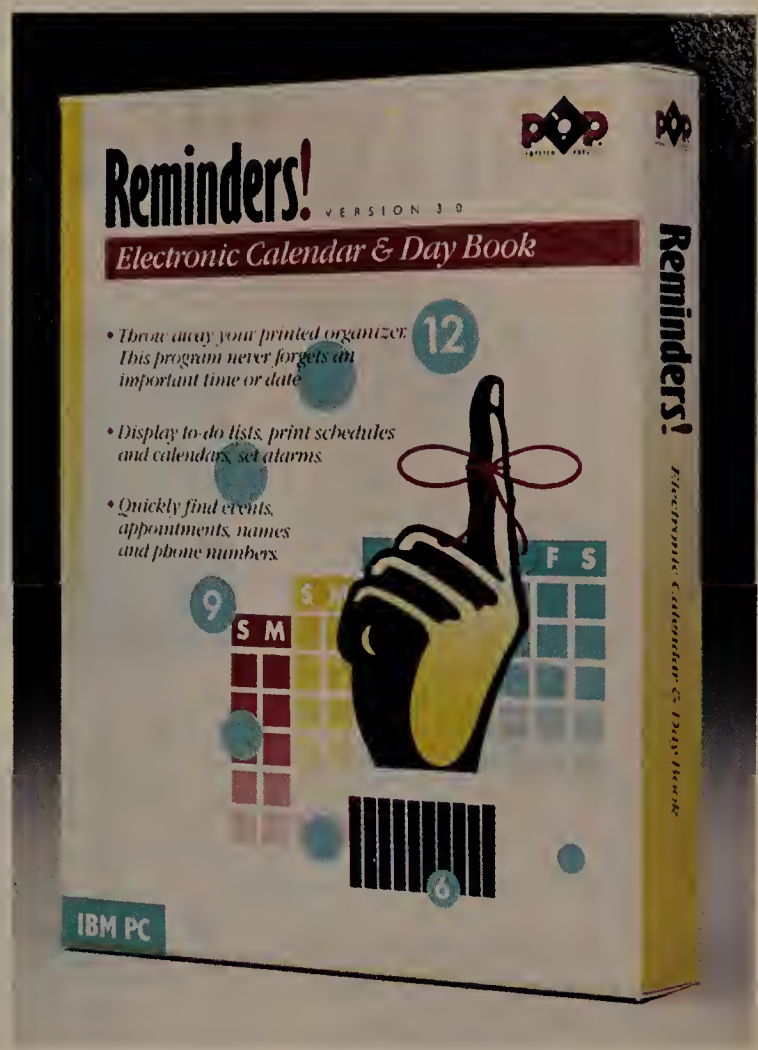
Which also keeps you out of trouble.

Reminders lets you organize and plan your calendar as far into the future as you want to go. So you need never miss an important meeting, appointment, birthday, anniversary, or any of the countless items on everyone's personal and professional agenda. And to make absolutely certain you'll never forget anything you need to remember, Reminders lets you set alarms at any time, on any date to jog your memory.

Reminders lets you organize all your phone numbers, and gives you all the space you need to make notes, add names, or do anything important right in the program's phonebook. Reminders will even dial a phone number for you.

Reminders also makes your life easier by allowing you to organize your tasks into manageable groups with a feature called "Categories". The "Log" feature lets you keep permanent records of past tasks and events. And Reminder's "Print" feature allows you to make anything in the program portable. So you don't have to stay in your office to stay organized.

Reminders also includes features that insert regular events into your schedule automatically, word search capabilities, a "Memory Jogger" feature that carries any undone tasks over to the next day, and a built-in alarm system that alerts you when you schedule an event that conflicts with something you already have planned.



And if you can't remember where you filed something, all you have to do is type in a key word or a few key words relevant to what you're looking for, and Reminders' "Word Search" feature will find the subject for you no matter where you filed it.

Reminders is a foolproof way to make sure nothing slips your mind. And despite mind-boggling number of tasks it does for you, Reminders is incredibly easy to use.

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POP COMPUTER PRODUCTS

POP Computer Products, Inc., P.O. Box 1389, Evergreen, CO. 80439 Technical Requirements: Computer – IBM PC, PS, or 100% compatible computers. Memory – 275K of available RAM; resident portion is 6K. DOS – PC or MS DOS v 2.0 or higher. Display – Monochrome or color monitors using CGA, EGA or VGA.

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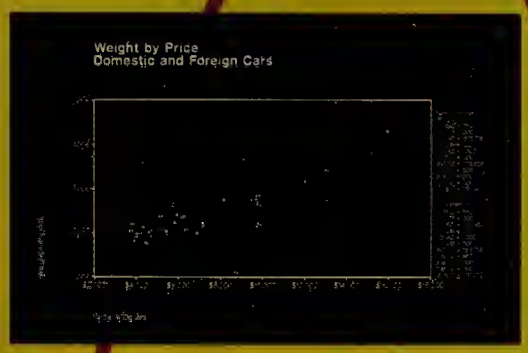

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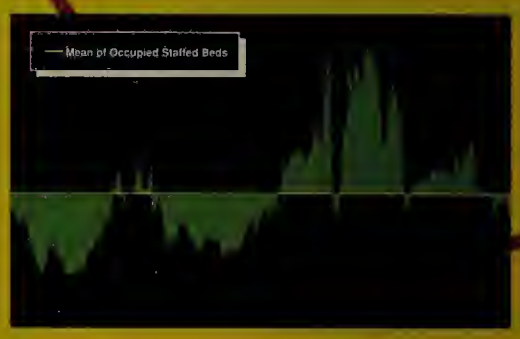

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R:base 3.1

PROS: Excellent form and report generators, data dictionary

CONS: No debugger, poor network performance

R:base makes building applications so easy, you may not need a developer to create them. It boasts a powerful programming language and superb report and form generators, and its pleasant interface and superb QBE make it second only to *Paradox* as an interactive data manager. *R:base*'s slow transaction processing makes it a poor choice for large, multiuser applications, and the program lacks a debugger, but it's a good choice overall.

R:base's mouse support and well-organized pulldown menus are buttressed by helpful prompts and superb documentation. But you may have to wait a while after you pick a command—the program can be sluggish. Data validation tools are extensive, even though you can't format data at the file level. The inability to view nonrelated multiple tables on screen mars otherwise top-notch interactive skills.

The *R:base* report generator is much like *dBASE IV*'s—it's easy to set up fields and report on related information. You have to hassle with variables and special expressions to create summary and calculated fields, but this makes *R:base* reports more flexible. Like *Paradox*, *R:base* provides statistical cross-tab reports.

If *R:base*'s superb application generator can't create the application you need, you can turn to the powerful programming language. The lack of an interactive debugger, however, means longer and more frustrating development time.

LAN support is fairly good, except that *R:base* is the only DBMS reviewed that won't let you create or change a report or form while the data file is in use. However, *R:base* is unique in that two users can simultaneously modify different fields in the same record.

If you don't have scores of users updating a data base, and if creating forms and reports easily is a top priority, *R:base* can fill your needs handily.

Watching the Data Flow

For the all-around Best Buy, nothing beats *Paradox*'s combination of interactive and programming features. If creating applications is your top concern, *FoxPro* is a good choice. If your development needs are simple and speed isn't an issue, *DataEase* and *R:base* make good interactive data handlers.

Conventional wisdom told us there were two kinds of data managers: multiuser monsters that require programming, and simple, limited flat-file ones. But programs like *Paradox* prove the choice between automation and improvisation needn't be a choice at all.

Celeste Robinson is a freelance writer living in Belmont, California, who specializes in data base management.

WHERE TO BUY

Advanced Revelation 2.03
Revelation Technologies
Two Park Ave.
New York, NY 10016
800/262-4747
LIST PRICE: full development version $995, four additional users $695, site licenses available; run time (one user) $200; SQL interface $695
REQUIREMENTS: 640K, DOS 2.11 or later version, hard disk; AT recommended
TECHNICAL SUPPORT: six months free, then by subscription, toll-free, M–F 6–5
OTHER SUPPORT: fax, BBS, authorized training centers
Reader service no. 650

DataEase 4.24
DataEase Int'l, Inc.
7 Cambridge Dr.
Trumbull, CT 06611
800/243-5123,
203/374-8000
LIST PRICE: full product $795, three additional users $795, five additional users $1095, with SQL support $995; developer utilities (includes royalty-free run time) $795
REQUIREMENTS: 640K, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: unlimited; toll number; toll-free, priority support by subscription M–Th 9–8, F 9–6
OTHER SUPPORT: BBS
Reader service no. 651

dBASE IV 1.1
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA
90509-9972
213/329-9989,
213/538-7895 (fax)
LIST PRICE: $795, five additional users $995, developer's edition (includes royalty-free run time) $1295
REQUIREMENTS: 640K, DOS 2.10 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, priority calls by subscription, M–F 6–4:30 except Th 6–4
OTHER SUPPORT: fax, GEnie
Reader service no. 652

FoxPro 1.02
Fox Software, Inc.
134 W. South Boundary
Perrysburg, OH 43551
419/874-0162,
419/874-8678 (fax)
LIST PRICE: $795, unlimited users $1095; royalty-free run time $500
REQUIREMENTS: 512K (640K recommended), DOS 2.0 or later version, hard disk; mouse recommended
TECHNICAL SUPPORT: unlimited, toll number, M–F 8:30–5
OTHER SUPPORT: CompuServe
Reader service no. 653

Paradox 3.5
Borland Int'l, Inc.
1800 Green Hills Rd.
Scotts Valley, CA
95066
408/438-5300
LIST PRICE: $795, five additional users $995; SQL Link $495; royalty-free run time $49.95
REQUIREMENTS: 512K, DOS 2.0 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–4:45, toll-free support by subscription
OTHER SUPPORT: CompuServe, BIX, GEnie
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R:base 3.1
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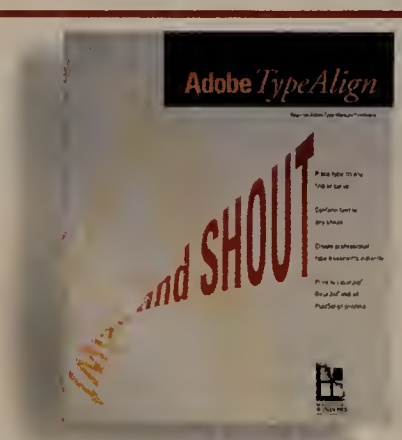

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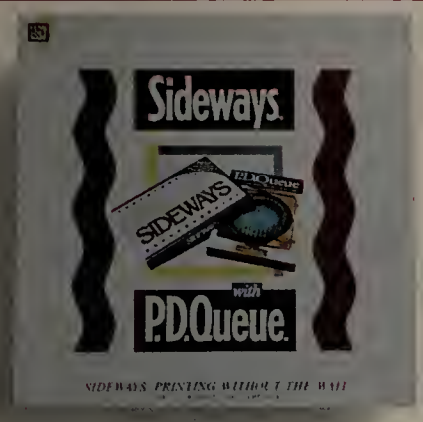

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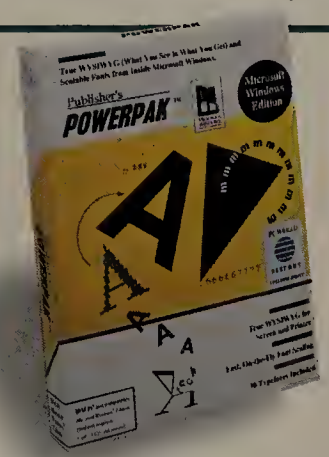

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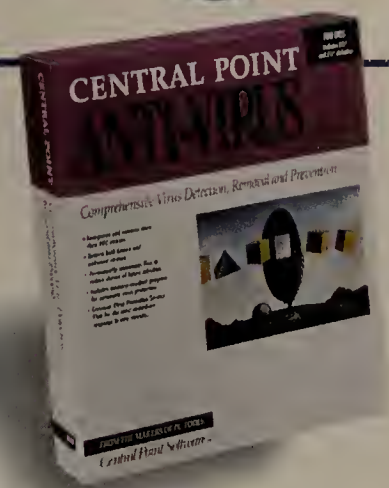

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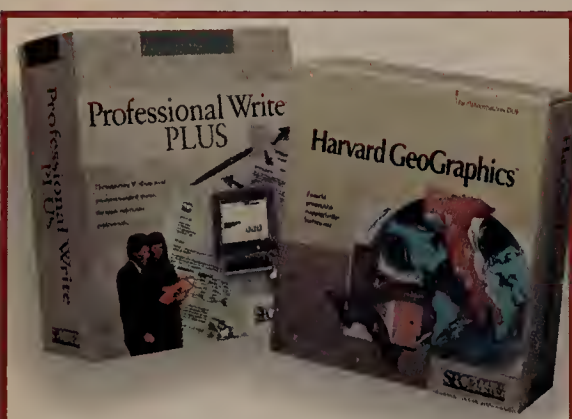

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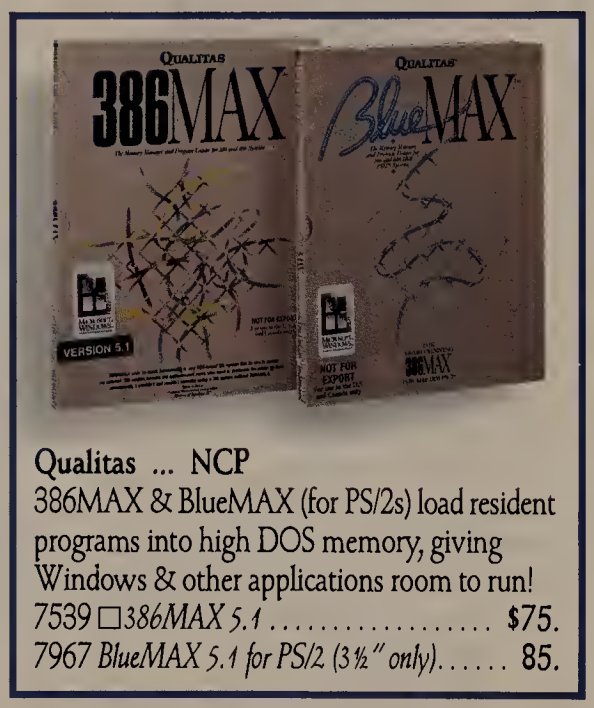

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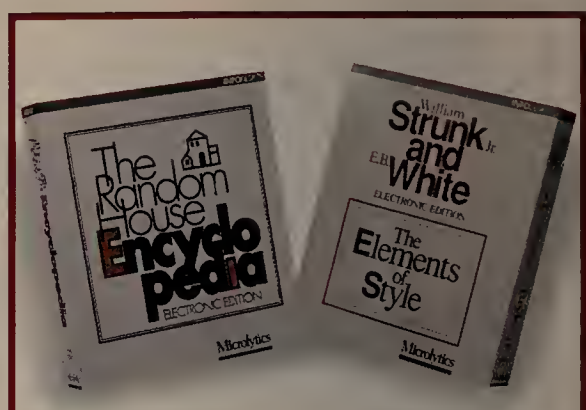

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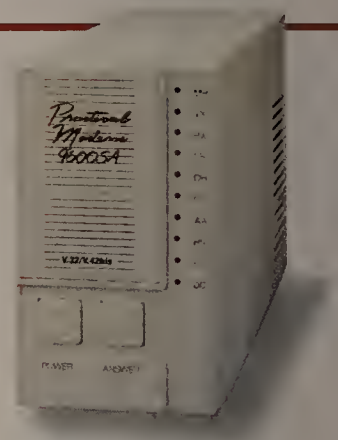

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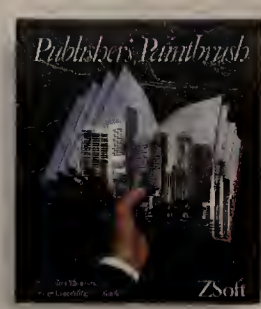

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SPECIAL REPORT

A PC World Supplement on Windowing Environments and Applications

WINDOWS WORLD

FEATURE

Multimedia Gets Down to Business

You've seen the video, you've heard the great big stereo sound—but what does multimedia mean to you? We take a look at the hot new applications coming down the line and tell you how multimedia is already changing everyday business computing. **158**

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Edited by Robert Luhn and Cheryl Goldberg

f e a t u r e

MULTIMEDIA GETS DOWN

t o B u s i n e s s

MULTIMEDIA standards will soon allow mainstream PC applications to incorporate sound, video, animation, and graphics. The result will be new forms of training, presentations, data bases, and communication.

Multimedia is a lot like art. You can't define it, but you know it when you see it. But even though no one can say what it is and most people don't know what it can do for them, *multimedia* has become the hottest buzzword in the PC industry.

One reason multimedia has become so hot recently is that Microsoft and IBM have put their stamp of approval on the technology by announcing versions of *Windows 3.0* and OS/2 that support it. With just a few hardware upgrades (see the sidebar "Multimedia Made Affordable"), the average *Windows* or OS/2 user will be able to run applications that incorporate sound, video, and animation.

Vendors are banking on the fact that adding these effects to applications will help combat information overload. "We have far too much information to deal with in the time we have available to make decisions," suggests Richard Hoakum, whose San Francisco company, Hoakum Associates, has been producing interactive video presentations for ten years. "Today, data has to be packaged in a form that gets to you faster. Ultimately, the feeling or emotion that the data conveys may prove more important than the dry data itself," he adds.

REAL-WORLD APPLICATIONS

To get a sense of what these multimedia applications for *Windows* will look like, *PC World* talked to a number of developers and early adopters of multimedia technology. We also looked at a number of projects created and under development for the PC, the Macintosh, and the NeXT machine. While the latter two are more advanced platforms for multimedia development, they indicate what *Windows* users can look forward to.

BY CONNIE WINKLER

ILLUSTRATIONS BY STEVE LYONS

DESIGNED BY AMPARO DEL RIO

INTERACTIVE TRAINING

Almost all the software and hardware vendors contacted believe that training will be the hottest multimedia application, at least in the immediate future. "The initial use of multimedia primarily is going to be in business education," says Ed Juge, director of marketing at the Radio Shack division of Tandy, which is due to release an inexpensive machine and upgrade kit for multimedia sometime this spring.

Multimedia PCs can provide "just-in-time" training, where a large amount of material is stored on a CD ROM and accessed as needed. For example, if you're a marketing manager who does sales forecasting twice a year, you might want a refresher on cross-tabulation just before preparing your findings. Just-in-time training saves the time and expense involved in sending executives to off-site training centers.

Multimedia software allows users to tailor training programs to their individual needs. To provide this capability, software developers use a technology called hypermedia to create interactive applications. With such software, a user can click with a mouse (or other pointing device) on a word or graphic anywhere on the screen and access video, sound, text, a graphic, or numbers offering additional information on the topic. Hypermedia gives the trainee control over both the sequence and the content of training material.

Herbert Cotter, director of multimedia marketing development for IBM, describes a future training system that would be available over networked workstations, with gigabytes of information stored on large optical storage devices. "Users would be able to bring up on demand any topic they needed help on," he explains. Such systems might feature a videotape of an expert talking about a subject and include questions and answers about the material. Individuals could branch through the training program, requesting additional information on material they didn't understand or skipping irrelevant sections.

Hypermedia gives the trainee control over both the sequence and the content of the training material.

One simple training application is already up and running in the Schenectady, New York, offices of General Electric's Industrial and Power Group. If a Macintosh IIcx user has a problem, Mac troubleshooter Steve Rosen works it through on his system and prepares a "tape" of how to fix it using the screen-recorder program *MediaTracks* from Farallon Computing of Emeryville, California. He then sends the captured sequence over the network to the employee needing assistance. Farallon also offers the MacRecorder sound system, which works in conjunction with *MediaTracks* to add sound, so users can record explanations to go along with the screen tapes.

Microsoft is already preparing training lessons for its own programs, though the company has made no specific announcements. "Microsoft will do things like provide animated lessons. Training for a spreadsheet might, for example, show someone circling numbers that will be changed. This type of training could make users want to learn and make learning easier," says Melinda French, group product manager of the Entry Business Unit. As a first step in that direction, Microsoft already offers the hypermedia-based *Productivity Pack* that teaches users about the functionality of *Windows* (see the review of *Microsoft Productivity Pack for Windows* in this Special Report).

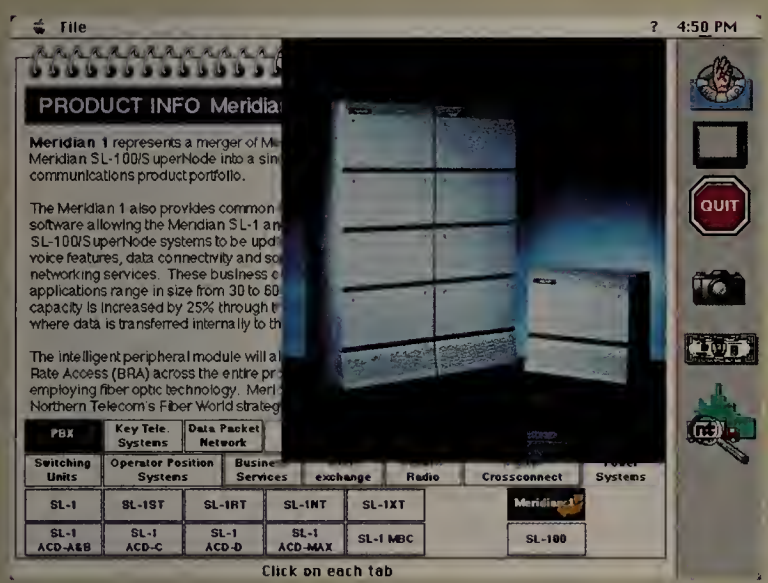
IMPROVED COMMUNICATIONS

A speaker's tone of voice usually helps people understand the intent of a statement. It's not surprising, then, that multimedia developers are working on ways to allow users to attach voice comments to applications such as spreadsheets, data bases, text documents, or E-mail.

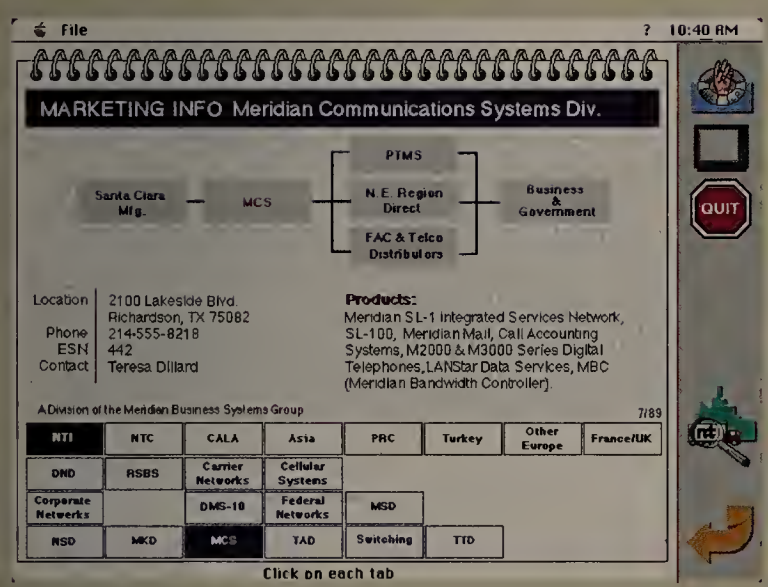
Steve Jobs's NeXT system has had this capability from its introduction—in early models, voice could be recorded via a plug-in microphone and the latest models have the microphone built-in. Admation's *Live Wire* uses this feature of the NeXT machine as part of a sophisticated system for live conferencing over a network. Users can select other participants from a list—each of whom

Ask-Me 2000 allows a nonprogrammer to produce a multimedia presentation that includes digitized video, created easily with a camcorder and a video capture board.

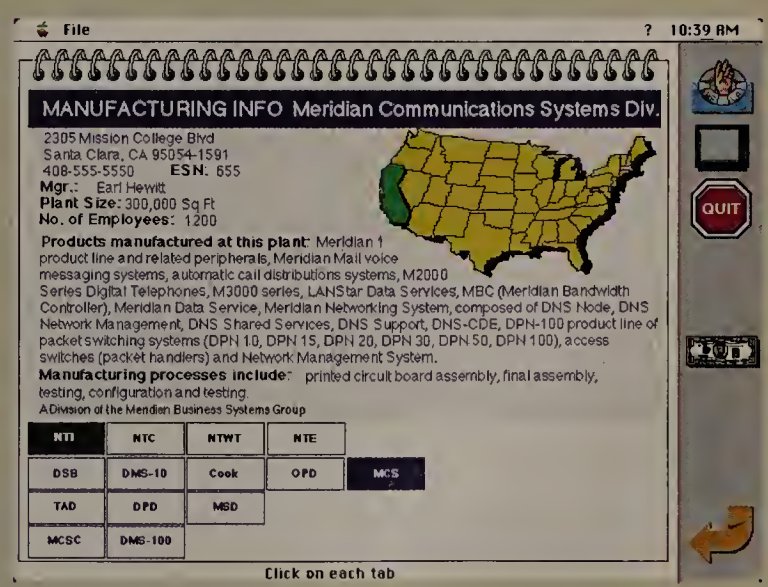
SCREEN 1



SCREEN 2



SCREEN 3



SCREEN 4

NAVIGATING A HYPERTEXT DATA BASE

Northern Telecom's hypertext-based Skillpath system makes it easy for employees to find information about the company's many products. The system consists of three data bases: one for products, one for manufacturing locations, and one for marketing locations. Because the system takes advantage of hypertext's navigational capabilities, users can jump from one data base to another by clicking on the appropriate icon. Each picture on the main menu, shown in SCREEN 1, takes you to a different part of the system. Icons on the Power Map bulletin board lead to information about various product lines; books on the shelf deliver you into the manufacturing and marketing data bases or give you access to reference material; items on the end table lead to training materials; and the TV leads to an overview of the entire system. Once inside a data base, such as the product information file shown in SCREEN 2 (the user has selected the photo of the product by clicking on the camera icon at the right of the screen), you can access marketing information (SCREEN 3) and factory information (SCREEN 4) by pressing the dollar bill or the factory icon, respectively. Clicking on the boxes at the bottom of the screen takes you to information about the company's other product lines.

will appear in an on-screen window—and can transmit text, voices, and images to them. The package can also save a report of the conference, including images and icons for voice attachments.

The three newest Macintosh models also come with built-in chips and operating system software that support sound, and a number of applications that support voice annotation have been introduced recently for the Mac. Ashton-Tate's *FullImpact* spreadsheet, *FullWrite Professional* word processor, and a number of E-mail packages such as CE Software's *QuickMail*, WordPerfect's *Office Mail*, and *Microsoft Mail* are just a few examples.

Although the PC is not quite as advanced as these other platforms, DaVinci Systems is showing a prototype of its *Windows*-based *DaVinci eMail* that can transmit sound as a binary attachment to electronic messages. The system will ship after the release of the multimedia version of *Windows*, which will provide the drivers for the sound boards necessary to support the voice annotations.

CUSTOMIZED PRESENTATIONS

One of multimedia's more straightforward uses is for impressive presenta-

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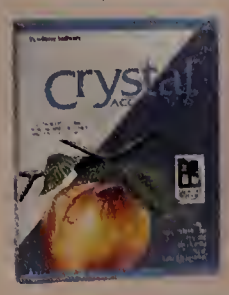

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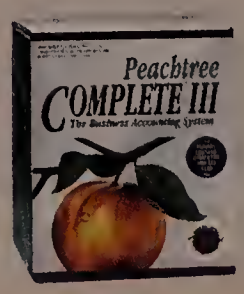

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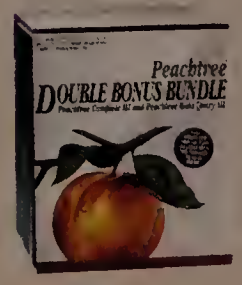

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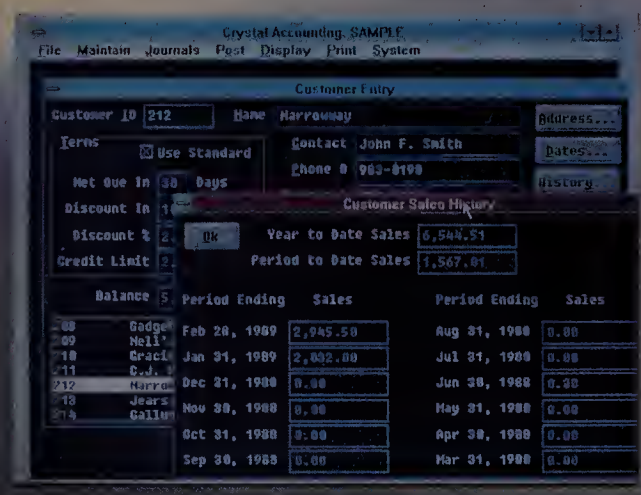
Why Windows Accounting? Productivity is the biggest benefit Windows brings to accounting software. Crystal Accounting uses the intuitive graphical interface and logical pull-down menu system to present accounting features that are faster to learn and easier to use, a savings that will pay off for your business now and in the future. And once you learn Crystal Accounting, you'll generally know how to use all Windows applications.

Information is more accessible in Crystal Accounting and can be displayed in multiple windows on the screen. Background processing is also a time saver. For example, you can print checks in one window while [illegible] in another.

Crystal Accounting supports [illegible] exchange, which [illegible] with other [illegible] information [illegible] could be [illegible] sheet. [illegible] accounting [illegible] simulta- [illegible] ix [illegible] general [illegible] oic- [illegible] and [illegible] are [illegible] n is [illegible] s [illegible] a [illegible]



Crystal Accounting modules are fully networkable and can handle an unlimited number of transactions, customers, vendors, employees, companies and cash accounts. This is an accounting program that can expand along with your business.

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Why Peachtree Accounting?

Crystal Accounting is priced at $495, and when purchased from Peachtree Software, carries a 60-day money-back guarantee. A $25 restocking fee does apply to product returns.

Peachtree also stands behind its products with a toll-free number for telephone support. As a registered Peachtree user, you may receive support on a pay-per-call basis using a major credit card or prepaid through the PeachCare™ program. Although Crystal represents an entirely new type of accounting software, you can be comfortable with the fact it is published by Peachtree Software, the leading supplier of microcomputer accounting products.

System Requirements

Crystal Accounting requires at least an IBM AT or compatible with a hard drive; 640K of memory (1 Meg is highly recommended); an EGA, VGA or Hercules Graphics Card; DOS 3.1 or greater; and Windows 3.0 or greater. A mouse is highly recommended.

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PCW

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Windows 3.0 is a great step forward. It just doesn't go far enough. You still have to overcome barriers you thought you'd left behind. Such as DOS. The complexities of file management and application integration. And working in two environments.

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To evaluate NewWave, call (408) 376-2727 for your interactive demonstration disk. (Handling charge $3.95.) Then experience one of the most dramatic breakthroughs ever brought to your screen.

HEWLETT PACKARD

HP NewWave requires Windows 3.0 and an Intel 286 or 386 based PC with 640 Kb base and 2 Mb extended memory. Windows 3.0 is a product of Microsoft Corporation. © 1991 Hewlett-Packard Company NSS9016

tions that include video, animation, music, and voices.

Northern Telecom, for example, has developed such a sales presentation to razzle-dazzle the topmost information system executives who make the checkbook decisions on Northern Telecom's networking and telecommunications equipment.

"Each group brings their own problems and issues, " says Leigh Kahan, manager of media development at Northern Telecom.

The solution to such diversity was about four hours' worth of video clips of experts addressing numerous points, plus assorted maps and charts that displayed various network configurations, all of it stored on seven laser disks behind the scenes. These elements are tied together by *Authorware Professional*, a Macintosh-based authoring package. (Authoring software is high-level programming language that developers use to put together multimedia applications.) A *Windows* version of *Authorware* has been announced and should be available by the time you read this.

The presentation is shown on two 4-by-6-foot televisionlike monitors. Using a remote control device, the presenter can quickly access appropriate multimedia materials using *Authorware*'s hypertext capabilities.

If you want to create your own presentations to run on a standard 286 (or above) machine with VGA graphics, Brown-Wagh Publishing offers *Ask-Me 2000*, one of the few low-end multimedia packages available for the PC. The $495 package is an authoring system that allows a nonprogrammer to create a multimedia presentation that includes even digitized video. Creating the digitized video is as simple as recording video with a camcorder and digitizing it with a product such as Jovian-Logic's $895 SuperVia video capture board. You can play back the video in an *Ask-Me* presentation on any VGA system. Although *Ask-Me* runs the video at 4 frames per second rather than the broadcast rate of 30 frames per second, the quality should suffice for many applications.

Greg Bennion of StudioGraphics in Redwood City, California, for example, has used *Ask-Me 2000* for all manner of presentations, from exhibits at trade shows, to an interactive training system for Chevron about shipping hazardous chemicals, to a demonstration for new parents on childproofing a home. "We can create an interactive system that doesn't have to use live video. And companies can master their application and add it to their sites without any new hardware," Bennion says.

We can use Ask-Me 2000 to create an interactive presentation, and companies can add it to their sites without any new hardware," Bennion says.

SOUPED-UP DATA BASES

Looking up information via a data base has never been easy. Although *dBASE* no longer requires that you use complex dot commands just to perform a simple query, learning its Command Center user interface is no picnic. And while picture data bases that can store and retrieve images have been available for a number of years, images could never be kept in a data base with other data. Powerful new hypermedia data bases are changing all that.

One firm that has already implemented such a data base is the big accounting firm of Ernst & Young. The company is using a proprietary hypertext-based relational data base system called HyperMAS running on PCs to support its CASE (computer-aided software engineering) methodology, which helps clients plan, analyze, design, construct, and implement new information systems. When clients have a question while reading through the methodology material, they can simply highlight an item with the mouse and request additional information. For example, highlighting 'critical success factors' segues the reader in seconds to other explanations or uses of the term without losing the reader's place in the original material. Because the alternative for clients is querying high-priced Ernst & Young consultants, the system offers substantial cost savings.

Northern Telecom has developed a similar hypermedia-based system, written in *Authorware Professional* and run on Macintoshes, to help keep its employees up-to-date on an ever-growing and increasingly complex product line. This data base also includes video demonstrations of how some of the products work.

COMPLETE BUSINESS SOLUTIONS

Systems that combine multimedia with a whole suite of linked *Windows* applications are even more impressive. Louis Berman, president of Braintree Ltd. in New York City, has combined multimedia with a *Windows* Dynamic Data Exchange (DDE) facility to create a super data base application that may portend powerful future applications.

Berman has come up with an application for orthopedists that combines a data base, graphics, and a DDE link to *Microsoft Word* into a system that ultimately produces reports for insurance companies. "Doctors are not willing to sit down and do paperwork," said Ber-

man. His application spares the doctors the chore of filling out insurance forms, while ensuring that the forms are filled out completely.

Berman's system guides a clinician or trained secretary through a series of branching questions that ultimately provide all the data the forms require. The response for each question is either a multiple-choice selection or a click on a drawing of a skeleton. For instance, the program's question 'Where does it hurt?' might be answered with a click on the upper portion of the leg. The program fills in the medical language, strings responses into sentences where necessary, and prints out the form.

The PC-based system uses *dbVista* from Raima Corporation of Bellevue, Washington, to store data and graphics. *ToolBook 1.0* from Asymetrix, running under *Windows 3.0,* links data—the name of a bone or the medical name for a particular problem, such as a bone chip—to the corresponding portion of the drawing in a hypermedia fashion. *Toolbook* was also used to program the DDE link between the data base and predefined *Microsoft Word* style sheets, which match the insurance forms so that data can be pulled into the forms automatically.

Berman plans to incorporate some of the new multimedia features when the multimedia extensions become available. "Eventually we'll pull in video and sound as narration," Berman says. "We could show the doctors telling the clerks what they should know, say, about the tibia."

Berman's and the other applications we've illustrated here represent the beginning of a fundamental shift in the way PCs present information. Instead of using only text, PCs can use the most appropriate means to get a point across. And just as a picture is worth a thousand words, sound, animation, and video will improve communication by another order of magnitude.

Connie Winkler writes about multimedia and technology from Seattle.

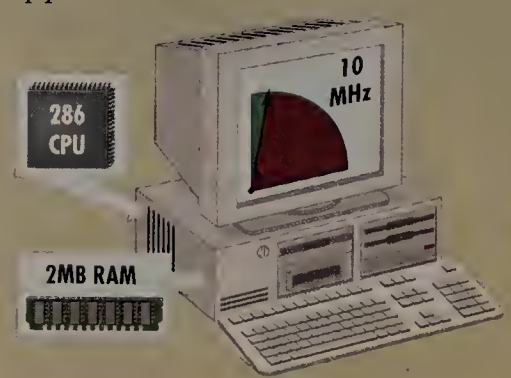
MULTIMEDIA MADE AFFORDABLE

All of the new multimedia software would be of little value if the hardware necessary to run it were out of reach for most users. Microsoft and Tandy have therefore defined a minimum standard configuration for running multimedia applications. The system consists of an IBM PC/AT (Intel 80286, 10 MHz) with 2MB of RAM, a 30MB hard drive, 8-bit VGA graphics, enhanced audio, and a CD ROM drive. (Because multimedia applications contain graphics, they tend to require the hundreds of megabytes of inexpensive storage space found on a CD.) Some multimedia developers argue that you really need an Intel 80386-25 machine with 4MB of RAM and all the other enhancements. Whatever base platform you elect, the only new investments required for multimedia are the CD ROM drive and the audio board.

Vendors who have announced plug-and-play systems equipped with all the necessary hardware and the extended *Windows 3.0* user interface include Zenith Data Systems, Fujitsu, NEC, Olivetti, CompuAdd, and Tandy. Media Vision has announced a $1299 upgrade kit, expected to ship by the time you read this, that includes a sound board and a CD ROM drive. At the time this article went to press, none of these systems had shipped, though Tandy says its may be available by the end of the summer.

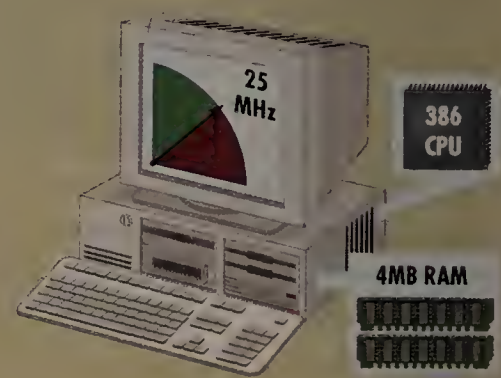
Anatomy of a Multimedia System

The systems illustrated here represent the standard platform that vendors recommend for running multimedia applications.



THE MINIMUM CONFIGURATION

10-MHz 80286
2MB RAM
30MB hard drive
8-bit VGA graphics
Enhanced audio
CD ROM drive



THE BEEFED-UP PLATFORM

25-MHz 80386
4MB RAM
30MB hard drive
8-bit VGA graphics
Enhanced audio
CD ROM drive

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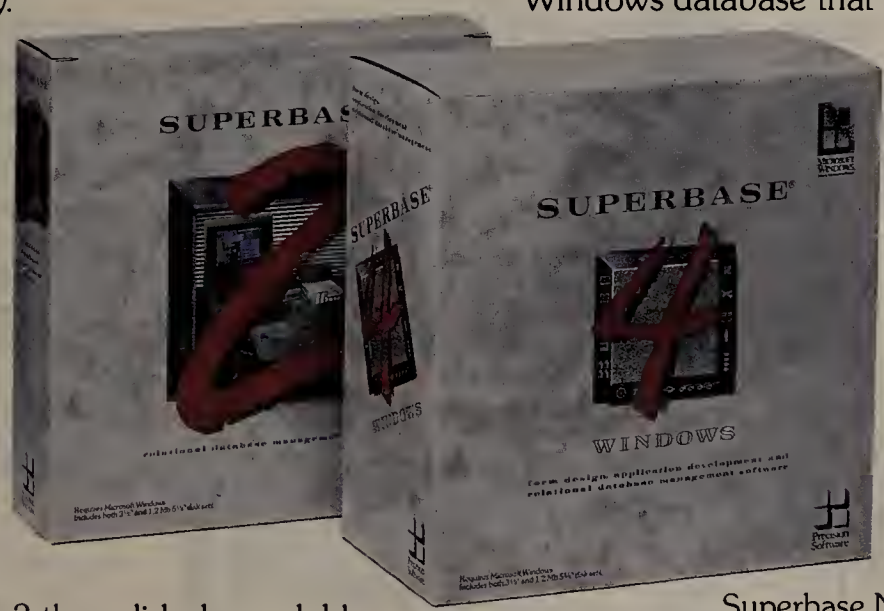

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OBJECTVISION

APPLICATION GENERATOR

Paul Litwin

TAKE a forms package, add some smarts, throw in links to common data bases, and you have *ObjectVision*—a visual application generator.

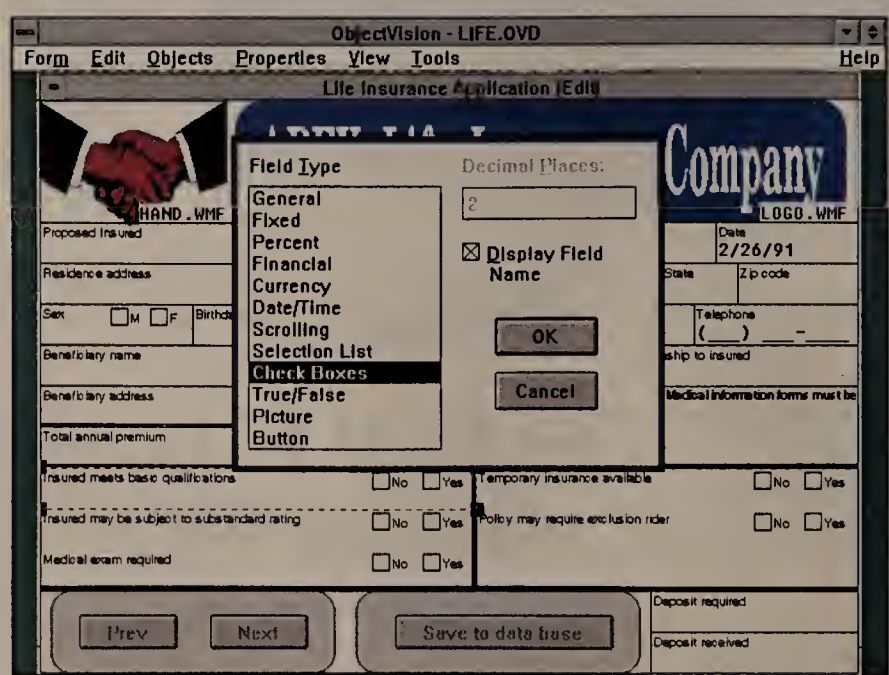
Programming "for the rest of us" has been hyped for years, but few products have ever delivered the goods. Apple's *HyperCard* and Asymetrix's *ToolBook* are a start—graphical mini–flat-file data bases that use a card-and-stack metaphor. But even these point-and-click programs require programming to be useful, and structuring an application can be confusing. If you are a power user who wants something a bit easier to grasp and a bit more intelligent—which includes links to work group–sized data bases to meet your growing application development needs—then Borland's *ObjectVision* may be the ticket.

ObjectVision applications are essentially intelligent forms that can pull in and manipulate data from a variety of sources. You design a form by plucking objects—fields, lines, boxes, and graphics—from menus and placing them on the form with a mouse. Once they're in place, you pick a field type from a separate menu that includes text, numeric, date, pop-up menu, and button options. In addition, you can mask fields and require users to fill them.

What separates *ObjectVision* from data base form generators is how it embeds intelligence in a form. Instead of writing formulas or procedural statements and attaching them to the desired fields, you create *decision trees*—visual representations of the logic you'd express in, say, a *1-2-3* macro or a *dBASE* program. A decision tree linked to a field can calculate values, validate entries, prompt for data, automatically fill in fields, pull up subsidiary forms, and much more. Decision trees can be far better than spreadsheets for such decision-support applications as loan approval forms, project planners, and cost estimators.

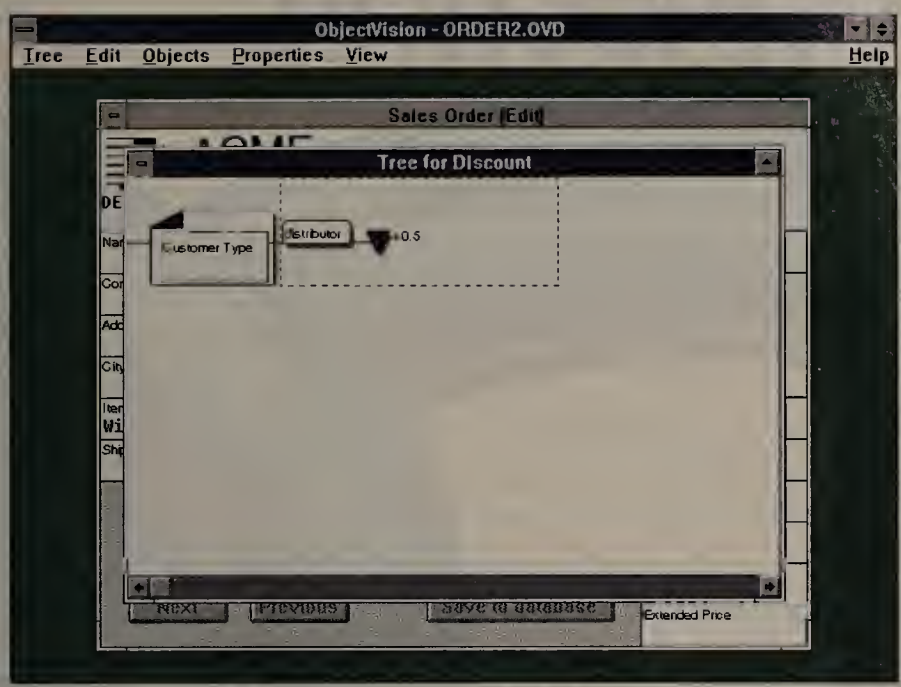
Although you'll find decision trees easier to deal with than @ISERR functions or IF...THEN statements, they're not for novices. Borland has made only an incremental improvement in its visual approach to programming. Creating a basic tree is mostly a point-and-click affair, and you can paste in functions and arguments from on-screen lists à la *Excel*. But there's no palette of common conditions to pick and choose from—you have to know the basic rules of Boolean expressions. In short, decision trees are good for visualizing relationships, but actually developing applications can be tough sledding.

As a data base front end, *ObjectVision* is pretty flexible. It reads and writes *dBASE*, *Paradox*, *Btrieve*, and ASCII data, and it reads data from any *Windows* program supporting Dynamic Data Exchange (DDE). Better still, multiple *ObjectVision* users can access networked data base files at the same time—*ObjectVision* adheres to stan-

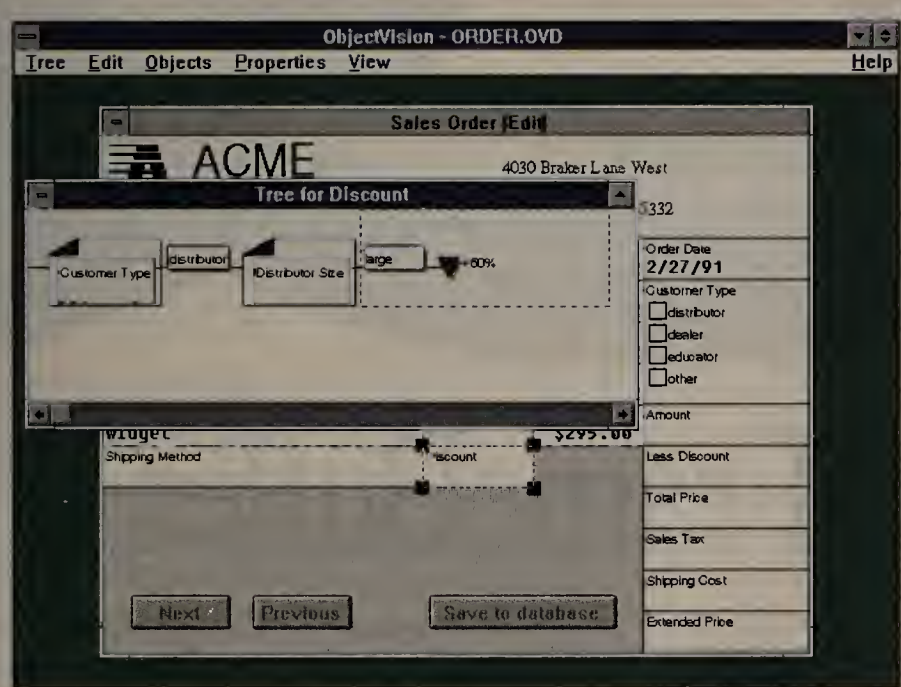


Once you've designed your form using objects—fields, lines, boxes, and graphics—chosen from various menus, ObjectVision lets you select a field type from a separate menu.

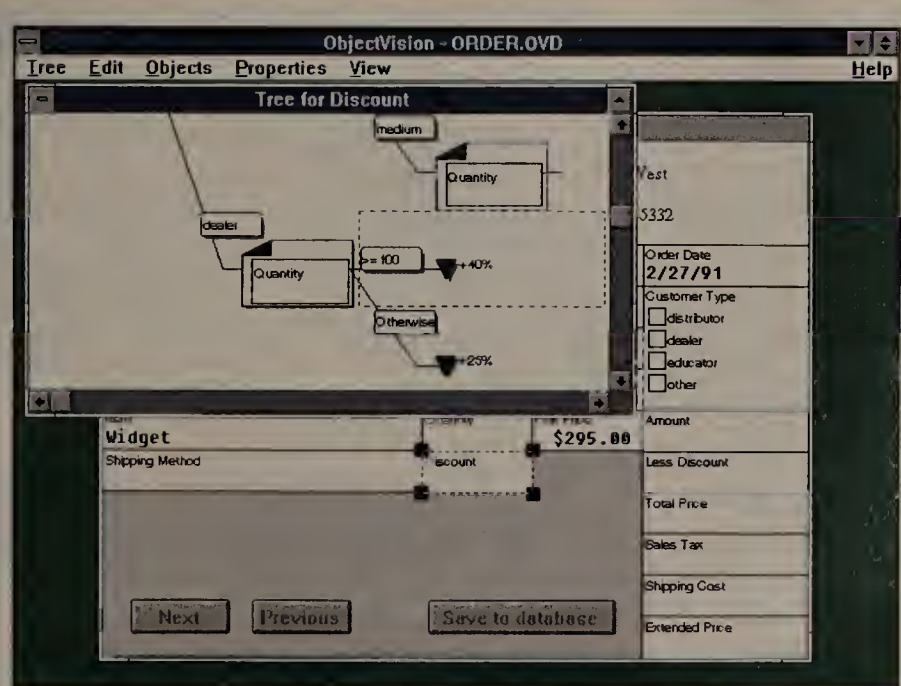
ObjectVision lets you build your own software using graphical "trees."



In ObjectVision you create applications using decision trees, which define the form to be created. Here, the structure of a customer discount form begins with the initial description of the subject.



The decision tree easily handles the increase in complexity as you further define the available customer discounts to depend on size and volume of purchases.



Using point-and-click actions to paste in functions from ObjectVision's on-screen list of alternatives, you can expand on the definition of customers and the discount options available to them.

dard file- and record-locking protocols.

In some ways, *ObjectVision* suffers in comparison with classic data base management systems and new, more powerful forms-oriented programs like Xerox's *FormBase*. A form can be linked to multiple tables and can pull a record from one table and match it to multiple records from another—however, corporate users will be dismayed to learn that *ObjectVision* can't link directly to SQL data bases. You can't control color fields, as in most forms programs, or the fonts used to fill in the forms created with *ObjectVision*. Moreover, *ObjectVision* doesn't automatically clear fields during data entry, and defining field validation rules is difficult. Programs like *FormBase* do all of the above without hassle.

Borland plans to remedy these shortcomings in future releases, so it pays to wait. But if you want to check out a new and perhaps better way to create personal applications, *ObjectVision* costs $495; a run-time module should also be available about the time *ObjectVision* ships.

Paul Litwin is a medical statistician and a contributing editor for Data Based Advisor *magazine.*

WHERE TO BUY

ObjectVision
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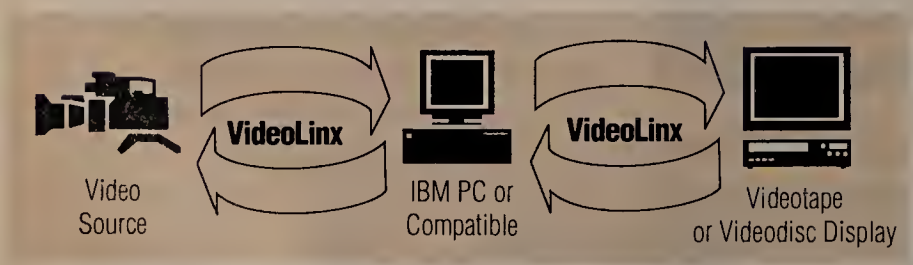

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PUBLISHER'S PAINTBRUSH 2.0

PAINT PROGRAM

Richard Jantz

PUBLISHER'S Paintbrush 2.0 may be the only graphics editor and paint tool you'll ever need. Since *Windows 3.0*'s debut, desktop publishers, artists, and graphics dabblers have been itching for a one-stop program that could run a scanner, manipulate the resulting images, or even let you create pictures from scratch.

Enter ZSoft's *Publisher's Paintbrush 2.0*, a trailblazer that should meet these challenges—and then some. *Publisher's Paintbrush 2.0* offers all the paint and image enhancement tools currently found in its DOS cousin, *PC Paintbrush IV Plus*, including support for a range of scanners and handy options for retouching scanned color and gray-scale pictures.

So why dump the powerful *IV Plus* if all you need to do is manipulate images? For starters, *Publisher's Paintbrush* comes with a set of electronic darkroom effects. *IV Plus* is also limited to 8-bit images with 256 colors or gray levels; *Publisher's Paintbrush 2.0* lets you retouch photo-realistic 16-, 24-, or 32-bit images (in both TIFF and TARGA formats) that pack more than 16.7 million colors. The program's customizable color palette works with high-end HLS (hue-lightness-saturation) color as well as standard RGB systems.

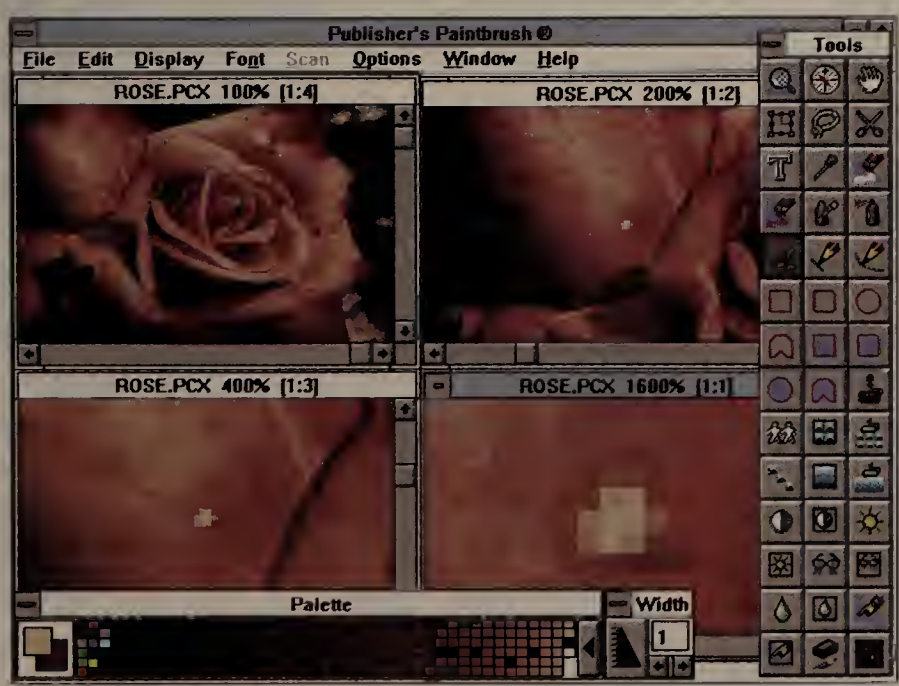
Publisher's Paintbrush 2.0 is also a little easier to use, though programs in this genre aren't for neophytes. ZSoft has cleaned up the interface, relying on logically nested menus and movable toolbox-style windows. You can't customize the toolbox as in *Micrografx Designer*, but you can display specific tools.

The paint tools are on a par with *IV Plus*'s—you get a blend paintbrush, smudge spray can, and so on. But there are some key enhancements. All tools now work at all zoom levels, and special effects such as Filter Blend (for smoothing and softening colors) have customizable parameters. There's also a Lasso tool for creating irregularly shaped cutouts and Clone, which replicates all or part of an image. The program accepts PCX, GIF, and MSP graphics files, plus 24-bit color TIFF, TARGA, and BMP files.

But what really makes *Publisher's Paintbrush 2.0* stand out is its deft multiple windowing capability. You can load up to eight different images in separate windows and cut and paste between them, or display eight views of the same image—a godsend when you're retouching gray-scale images. For example, you can display 100, 800, 1600, and 3200 percent views of the same area in different windows, automatically centering the selected area in each window. Even Xerox's *Gray F/X* doesn't offer this kind of editing flexibility.

And *Gray F/X* doesn't run under *Windows* or offer color support or paint tools. If any of these are must-haves—or if you just need a paint program for all seasons—*Publisher's Paintbrush 2.0* demands your consideration. ZSoft confirms the package will ship by March 1991 for $495; registered users of most ZSoft products can make the switch for $75 to $275.

PC World *contributing editor Richard Jantz is the author of* Ventura for Windows 3.0 *(John Wiley and Sons, New York, 1991).*



Publisher's Paintbrush 2.0 displays multiple views of an image in separate windows—ideal for editing complex color or gray-scale images. You can edit in close-up view and see the change reflected at other magnifications.

WHERE TO BUY

Publisher's Paintbrush 2.0
ZSoft Corp.
450 Franklin Rd. #100
Marietta, GA 30067
404/428-0008, 404/427-1150 (fax)
Reader service no. 657

MICROSOFT PRODUCTIVITY PACK FOR WINDOWS

TRAINING PACKAGE

John Walkenbach and Joice Simpson

PROS: Hands-on interactive tutorials, easy to find and run lessons

CONS: Cannot be installed through Windows, cannot switch to other applications while tutorial is running

WINDOWS 3.0 has taken the PC world by storm—and it has the bedraggled refugees to prove it. Many would-be users are baffled by features that are supposed to make life easier, and some longtime users still wonder when they will see that magical increase in productivity.

Microsoft's *Productivity Pack for Windows* ably bridges the learning gap for old and new users alike. It features a step-by-step tutorial with attractive graphics and hands-on exercises. A novice can spend 3 hours and gain a thorough understanding of *Windows;* more seasoned users can enhance their knowledge with the advanced sections. *Productivity Pack* also includes two help files that provide on-line troubleshooting as you use your applications.

Productivity Pack is designed to hold your hand, but if you're even slightly familiar with *Windows,* you may balk at where it leads you at first. You must install it outside *Windows,* and when you run the tutorial it won't let you run other *Windows* programs—a strange way to demonstrate multitasking.

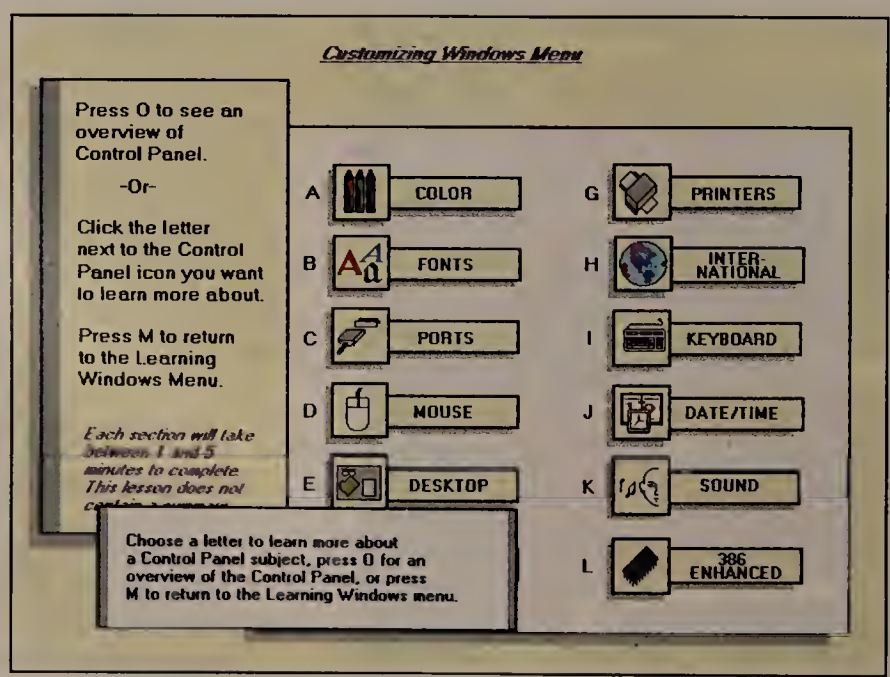
The tutorial consists of hands-on lessons grouped into six categories, each one featuring a character from history or literature as your guide. The lessons are more or less dull, depending on whether you're amused by cutesy story lines. For instance, Cleopatra shows you how to use the Clipboard while cutting and pasting paragraphs from a royal proclamation; Sherlock Holmes, uttering the occasional "by Jove," asks you to help him organize his clues using the File Manager.

The tutorial emphasizes hands-on practice and progresses logically from elementary to advanced levels. Novices should follow the lessons in order, but experienced users can use the Control function, a pop-up list of commands, to jump around the tutorial.

The two help files that come with *Productivity Pack* supplement your standard *Windows* help files. Troubleshooting Tips covers 19 common problems related to networks, printing, and memory. Working Smarter contains advice on making *Windows* more efficient and fun to use.

Productivity Pack compares favorably with other options for learning *Windows.* Its tutorial is comprehensive and certainly much cheaper than classes, and the interactive hands-on approach should appeal to everyone. All in all, *Productivity Pack for Windows* is an effective way to bring *Windows* users up to speed.

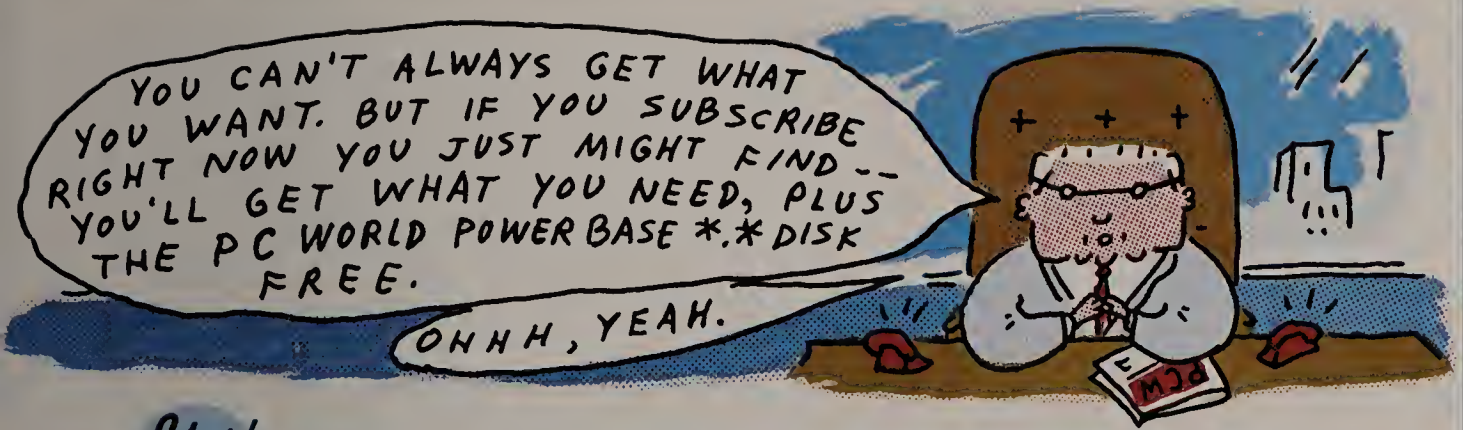
John Walkenbach is a contributing editor for PC World. *Joice Simpson, a photographer and graphic artist, is a recent convert to* Windows.



Learn Windows at your own pace: You can skip over sections that you know about or are not interested in.

WHERE TO BUY

Microsoft Productivity Pack for Windows
Microsoft Corp.
One Microsoft Way
Redmond, WA 98052-6399
800/323-3577, 206/882-8080
LIST PRICE: $59.95
TECHNICAL SUPPORT: unlimited, toll number, M–F 6 a.m.–9 p.m.
OTHER SUPPORT: none
Reader service no. 658



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COREL DRAW 2.0

DRAW PACKAGE

Deke McClelland

PROS: Bézier curves; blending, distortion, and three-dimensional effects; massive font, clip-art, and symbol collection; auto-tracer

CONS: Imprecise Bézier controls, no true masking, color bit maps can't be separated

COREL DRAW was an overnight success—and small wonder. It was quick, easy to use, well-documented, compatible with a number of graphics file formats, and a whiz at manipulating type. But for many advanced users, *Corel*'s drawing tools were less precise and its transformation features less powerful than *Micrografx Designer*'s.

Corel Draw 2.0 solves both problems. For example, you can create point-by-point Bézier curves with the pencil tool—a must for complex drawings. Designers and business presentation types will love the ability to design custom dotted and dashed lines, arrowheads, and patterns. For gradations and transitional effects, a Blend command can transform one color into another, transmute graphics or even text, and make transformations follow a curve.

For 3-D effects, the Perspective command lets you scale one or two corners of an object independently of the others, so the object appears to recede. Conversely, Extrude makes objects seem to leap off the page. You can even make objects look as if they were viewed through a fish-eye lens.

If you spend a lot of time drawing detailed illustrations, take heart. You can display grids on screen, specify horizontal and vertical increments independently, and move the origin—and call on *PageMaker*-like nonprinting guidelines and adjustable rulers.

Type handling, of course, is *Corel*'s forte. Version 2.0 adds 51 scalable fonts (for a total of 153); since *Corel* can convert any of its fonts into Adobe Type 1 format, accessible by most *Windows* applications, you may never need to buy another typeface. And at last, you can import ASCII text and create text blocks of up to 4000 characters.

Corel also throws in 750 clip-art images and 3000 symbols. Another utility, Corel Trace, converts scanned images into editable vector graphics almost as well as *Adobe Streamline* and even accepts TIFF and TARGA images with 16.7 million colors.

Of course, *Corel* isn't perfect. Unlike *Adobe Illustrator*, *Corel* can't precisely control the creation of Bézier *cusp points*—the corners associated with one or more curved segments. And there's no true masking feature—you punch holes to let objects underneath show through. But these are minor problems. The first *Corel* was a Best Buy, and *2.0* follows in its footsteps.

Deke McClelland is the author of Drawing on the PC *(Business One Irwin, Homewood, Illinois, 1990).*

Corel's Extrude command was used here to transform a text block into 3-D letters. Then the paths were distorted with the Envelope command, forcing the type to bulge outward.

WHERE TO BUY

Corel Draw 2.0
Corel Systems Corp.
Corel Bldg.
1600 Carling Ave.
Ottawa, Ontario K1Z 8R7
Canada
613/728-8200
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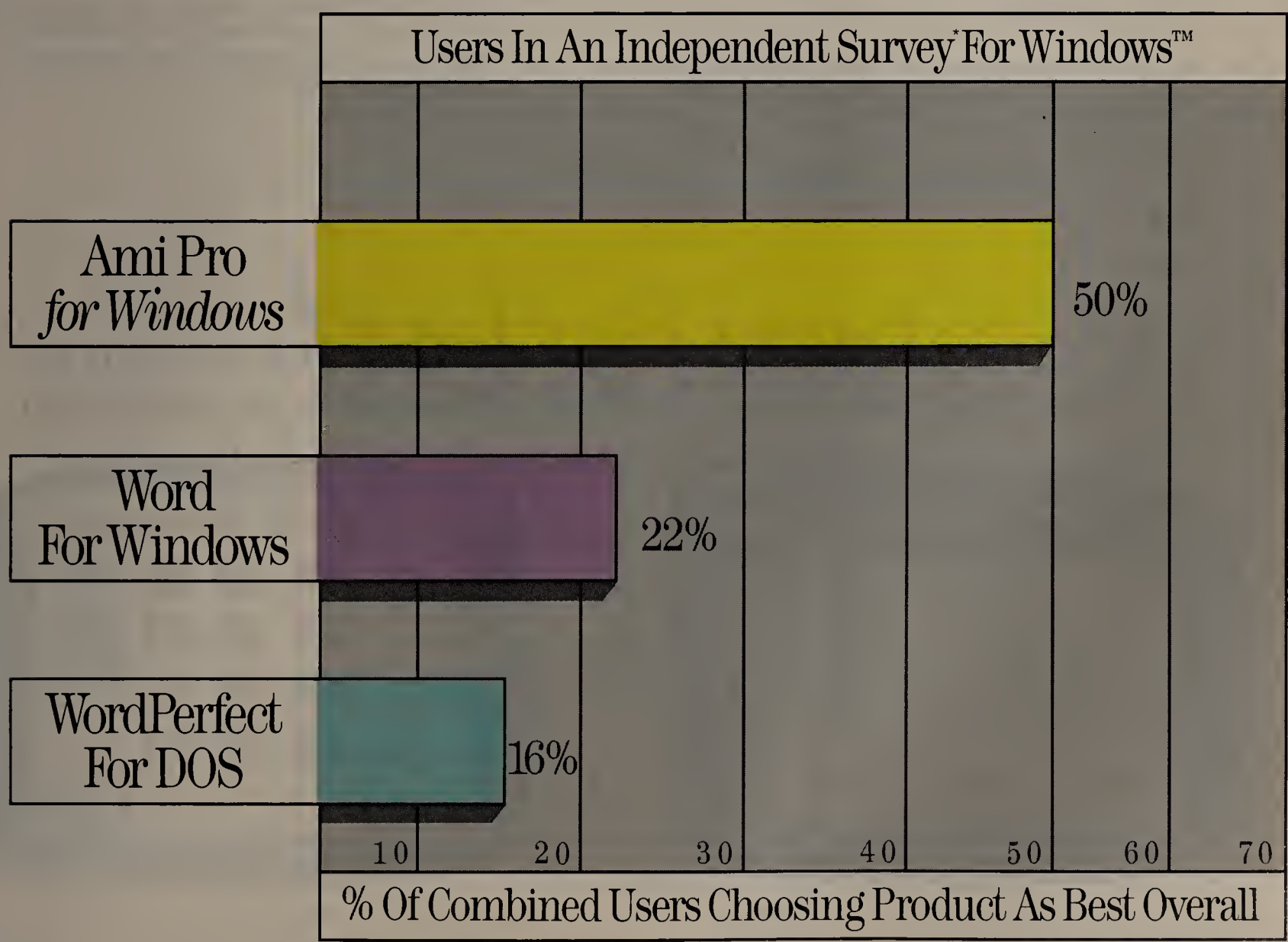

*Independently conducted Windows word processing Usage & Attitude Study, November, 1990. Figures cited are among Word for Windows users that are also users or triers of Ami Pro.

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Try Ami Pro™ for Windows™ just once, and you'll see why users prefer it by such wide margins over other word processors. With more than 360 powerful features, and its incredibly flexible formatting tools, it's not surprising that Ami Pro has unmatched quality in printed output.

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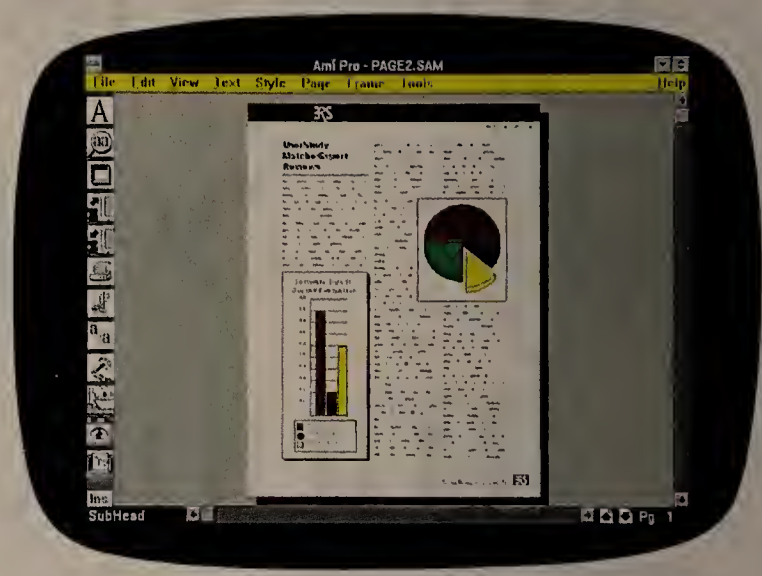

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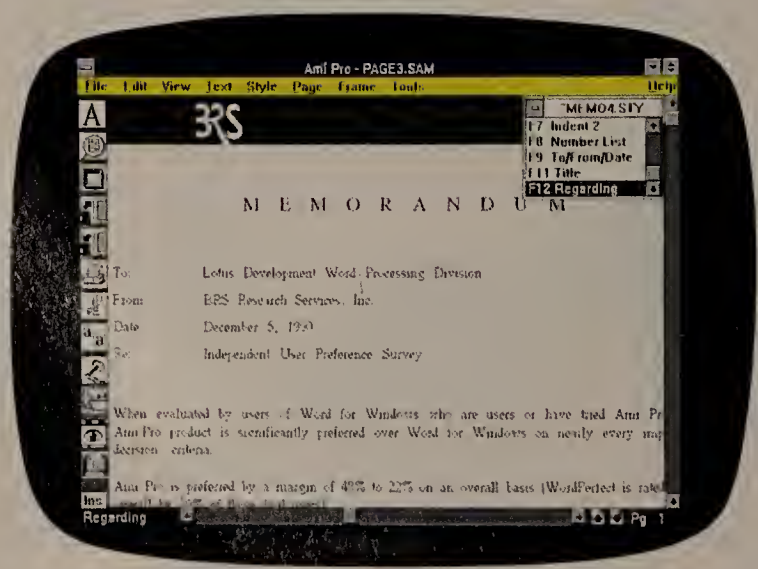

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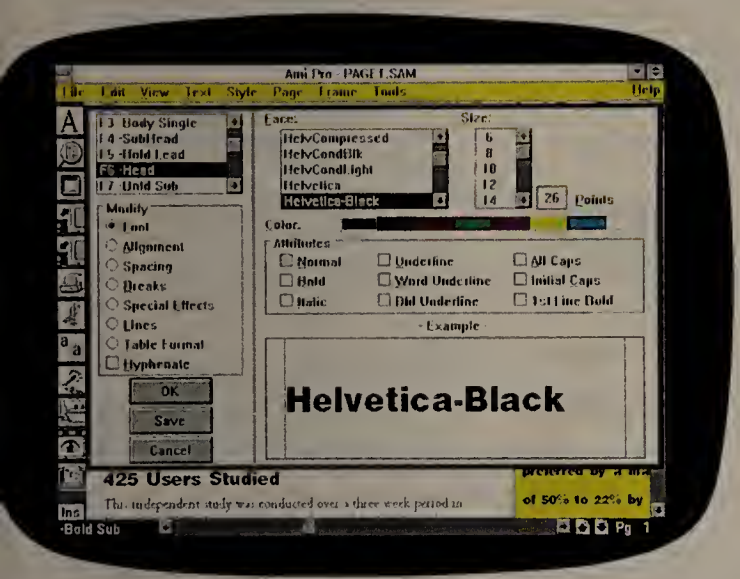

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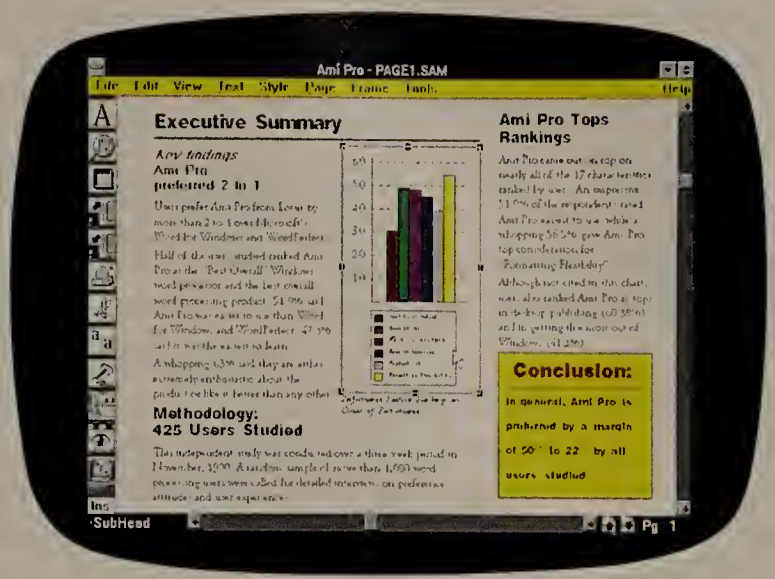

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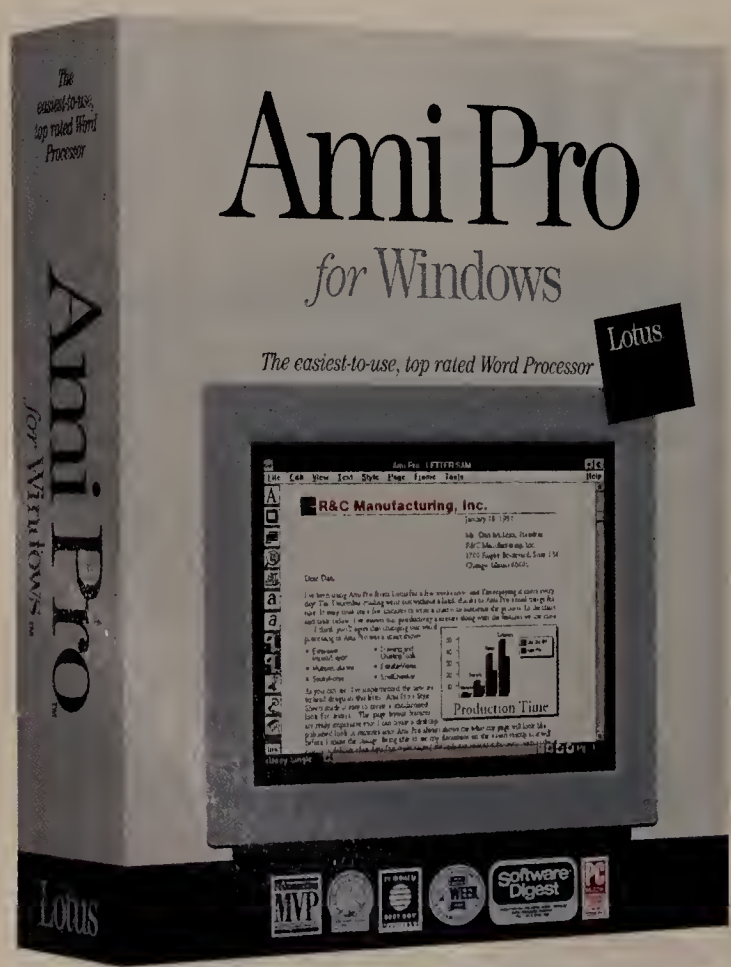

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*Reprinted from Software Digest April 1990 © 1990 NSTL, Inc., PC Magazine July 1990 © 1990 Ziff Communications Co. **The working model comes with its own Windows demo version and lacks some features including thesaurus, spell checker and ability to save files.

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PACKRAT 3.0

PERSONAL INFORMATION MANAGER

Patrick Marshall

PROS: Cleaner interface, excellent phone log and scheduler, strong DDE links with Word for Windows, network version available

CONS: Inflexible keyword searches, minimal DDE links to Excel, manuals poorly indexed and missing new features

PACKRAT—the graybeard of *Windows* personal information managers (PIMs)—is now in its third major release and, like good wine and *Windows*, it's improved with age. Not only has Polaris Software streamlined the program's interface, but *PackRat* now makes excellent use of *Windows'* Dynamic Data Exchange (DDE) facility. In the PIM pantheon, *PackRat* is a compromise between the customizable but obdurate *Current* and the amiable if somewhat limited *DeskTop Set*.

Users familiar with earlier versions of *PackRat* will find the same flexible scheduler that automatically checks conflicts and makes repetitive scheduling easy. Professionals who do time billing will love *PackRat's* easy-to-use phone log. Set up billing rates for a client, and *PackRat* will automatically compute the charges and report cumulative totals. An expense tracker, a mini–project manager, and other mini–data bases are part of the deal. But the best news is *PackRat's* revamped interface, a graphical daily schedule with icons at the top representing other modules. You can remove unwanted modules, and you can pop up a monthly calendar at any time.

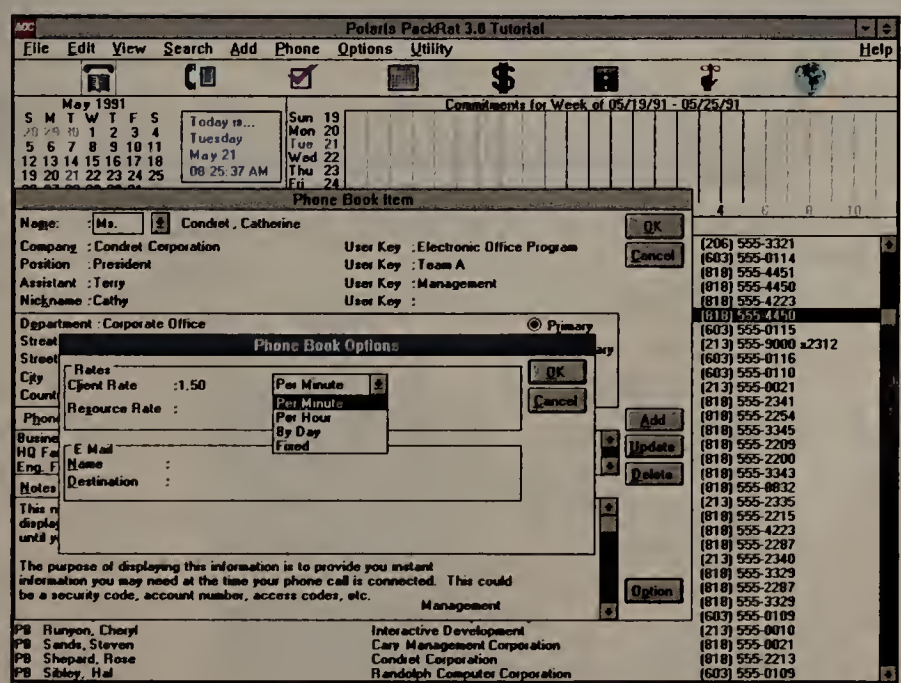
PackRat's integration has also been beefed up. Like *Current*, *PackRat* lets you link items in different modules with a point and a click. You could, for example, attach project tasks and other items to a name, then later view all the items by summoning the person's phone book entry. Unfortunately, all linking has to be done manually—you can't highlight a phone book entry and then set an appointment with the appropriate phone number automatically linked to it, as you can in *DeskTop Set*.

PackRat really taps DDE's potential. For example, with its special macros, *PackRat* adds a Find Name in PackRat option to *Word for Windows'* Insert menu, so you can search through *PackRat's* phone book and insert names and addresses into a document. You can't edit *PackRat's* DDE macros, but Polaris promises new macros for *Excel 3.0* and other DDE-supporting applications.

Of course, *PackRat* has a few wrinkles. You can't perform a keyword search for an appointment while the day's schedule is on screen. And though *PackRat's* slick phone log will compute billings, it can't recalculate old entries if you decide to up a client's rate.

Still, *PackRat 3.0* is a major step forward, and it's the only *Windows* PIM that comes in a LAN version—a key advantage for any office making the move to *Windows*.

Patrick Marshall writes for Congressional Quarterly's Editorial Research Reports *in Washington, D.C.*



One of PackRat's big pluses is its time billing module. Set up a fee rate, and every time you call the client, PackRat computes the time and charges. Via DDE, you can zip the information to Word for Windows.

WHERE TO BUY

PackRat 3.0
Polaris Software
1820 S. Escondido Blvd. #102
Escondido, CA 92025
800/338-5943, 619/743-9964 (fax)
LIST PRICE: $395, three-user version $695, $150 for each additional workstation
TECHNICAL SUPPORT: unlimited, toll number, M–F 8–5
OTHER SUPPORT: CompuServe forum
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WINDOWS WORKSHOP

Practical Advice on Mastering Windows 3.0

Jesse Berst

THIS MONTH: *PC World* introduces a new column that will offer tips and tricks on using *Windows 3.0.* Look for it each month in the How To section of the magazine. This first column tells you how to give your DOS programs a boost with PIFs.

If you're like most *Windows 3.0* users, you run a lot of DOS programs in that environment. To add a program to an application group, you select *File New Program item* and fill in the form. Double-click on the program's new icon, and you're off and running.

But if you want to load a DOS program with a different active directory, display it in a window, or dictate multitasking priorities or memory use, you'll need a program information file (PIF). *Windows* generates PIFs for some popular DOS applications automatically; for others, you select the application and create the PIF from scratch. In either case, you merely double-click the PIF Editor icon in the Accessories group, fill in the form, and save it.

If you're running *Windows* in 386-enhanced mode, you may need to create an Advanced PIF. Click the Advanced button in the basic PIF Editor window, and a more detailed form appears (see **SCREEN 1**). Here are some tips to turbocharge your programs.

TIP 1 Dedicate the CPU to your program. When a DOS program runs slowly in enhanced mode, it's usually because *Windows* is doling out processing time to other applications running in the background. The solution: In the basic PIF Editor window, check the Exclusive box. You can still switch instantly to the other applications, but they'll be asleep in the background until called.

TIP 2 If you run background applications, give your DOS program more processor time. Under Multitasking Options in the Advanced PIF dialog box, increase the Foreground Priority to at least **400** (1000 is the maximum). Note: The number affects the ratio of processor time provided to the foreground and any background applications. If the foreground program is set at 100 and two background applications at 50 each, the total priority is 200—and your foreground program would get half the CPU time (100:200). It's not a precise system, so experiment.

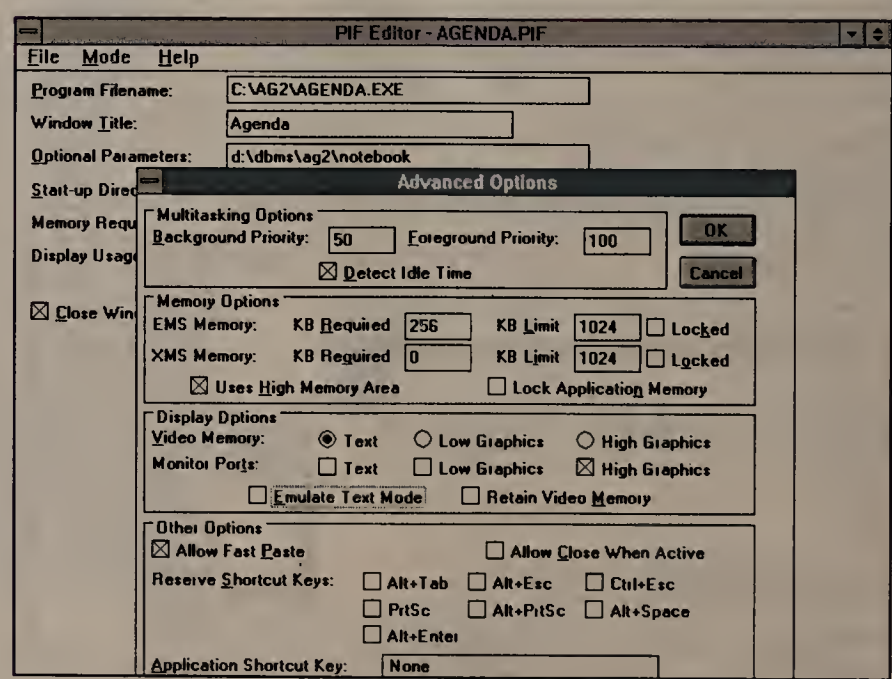
TIP 3 Run the program full screen. Simply click *Full Screen* in the basic PIF Editor window. If you run a DOS program in a window, *Windows* will snatch some CPU time for itself.

TIP 4 If a text-based DOS program drags its feet, make sure the Monitor Ports boxes in the Display Options section of the Advanced PIF dialog box are unchecked. If you use text and graphics programs together (such as *1-2-3* and *Allways*), run them full screen, select Video Memory's High Graphics button, and check *Retain Video Memory*. This reserves enough memory for an EGA or VGA graphics screen or multiple text screens.

TIP 5 Dole out RAM sparingly. In the Advanced PIF dialog box, enter the maximum RAM the program can have in the KB Limit field in the Memory Options section. The KB Required field dictates how much EMS or XMS (extended) memory must be available before *Windows* will open the program. In most cases, you can put **0** here.

With a little trial and error, your PIFs will make your DOS programs feel right at home in *Windows.*

Jesse Berst is publisher of the Windows Watcher *newsletter and author of* The Windows Bible *(Peachpit Press, Berkeley, California, 1991).*



SCREEN 1: The Advanced PIF dialog box lets you determine how a DOS program shares resources with other applications. You can dictate how much CPU time a program gets, reserve EMS or XMS memory, and even define shortcut keys.

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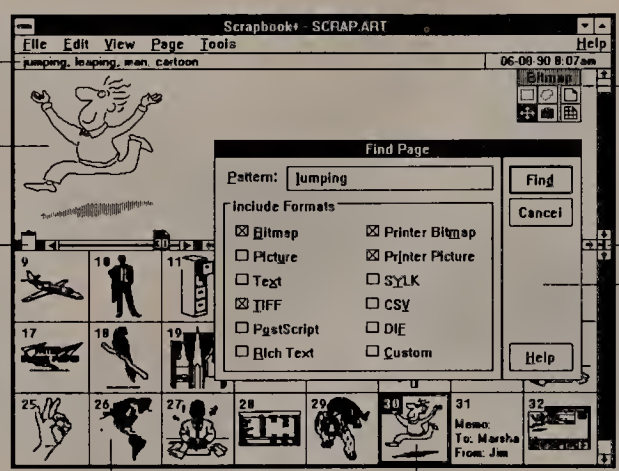

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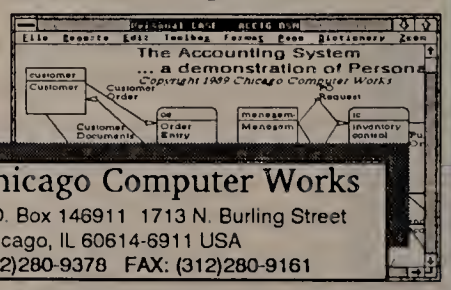

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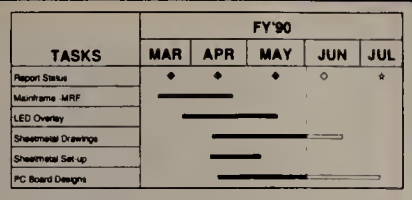

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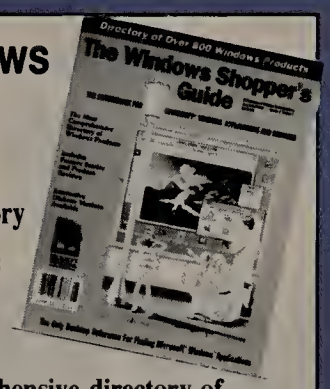

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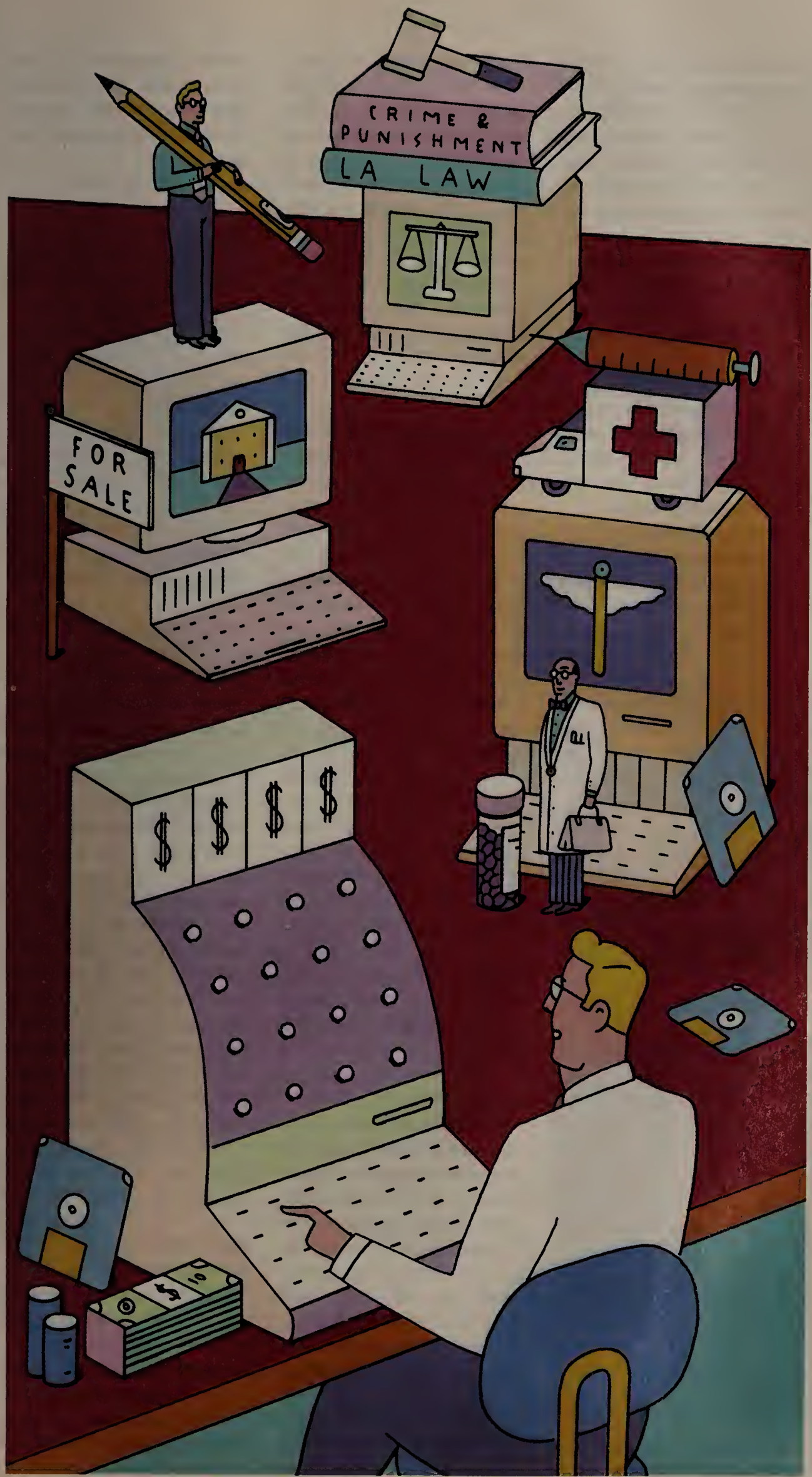
PROFESSIONAL & SMALL BUSINESS

Software

If you're a doctor or lawyer, engineer or architect, graduate school prepared you to hang out a shingle and go into business for yourself. What it probably didn't teach you was how to run that business. Luckily, there are a host of programs, known collectively as *vertical market* software, that are specifically designed to help professionals manage money, clients, and projects. Vertical market programs are tailored for a particular business or profession. They use familiar terminology and solve problems common to a specific field. But you won't find them at your local software hut; they're available only from manufacturers or resellers, and at considerably higher prices than their off-the-shelf cousins. However, getting the same level of functionality from horizontal programs takes a lot of work, and even then you may not get exactly the right features (see the sidebar "Have It Your Way: Developing Custom Business Applications"). Vertical programs give you the tools you need right out of the box—and to many professionals, that's worth the extra cost.

STEVE BASS



NEED TO RUN A SMALL BUSINESS? THIS GUIDE OFFERS 46 PROGRAMS SPECIFICALLY DESIGNED TO HELP GET YOUR BUSINESS ON THE FAST TRACK.

This buyers' guide covers 46 products that are designed to help consulting engineers and architects, lawyers, medical professionals, realtors, and retailers do business. (These categories were chosen based on statistics about *PC World* readers who run small businesses.) All work on systems from XTs on up and require a hard disk.

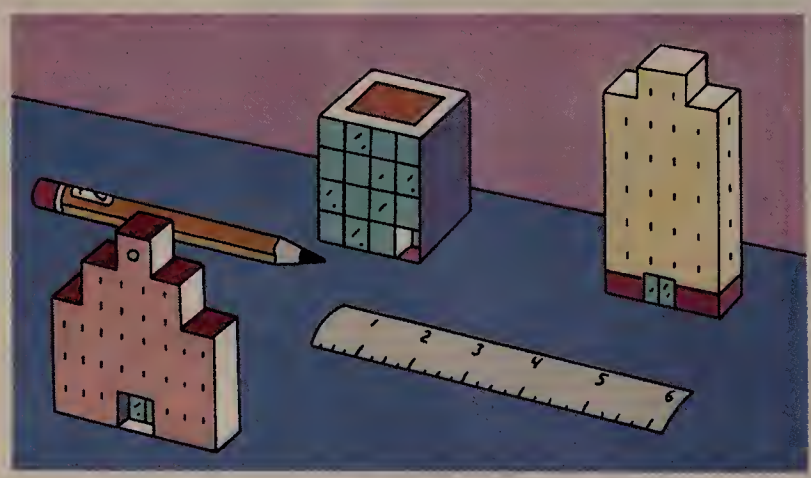
While their features may vary widely, most vertical packages have a similar structure. Typically, they revolve around a data base for storing client information, and most provide a full-fledged accounting system or links to established accounting packages such as SBT's *Accounting Library* or Computer Associates' *Accpac* series. Many of them also include a word processor for creating reports and correspondence, an appointment scheduler, or a library of standard forms. Need software the whole office can use? Most packages come in both single- and multiple-user versions.

The programs covered in this guide are either integrated or modular systems. Integrated systems usually consist of different components or modules between which you can move seamlessly. Modular packages are typically a series of standalone programs; they allow you to start out with a lower-cost system and add modules as your business expands.

In either case, the key features are ease of use, end-user support, and flexibility. The best systems offer pop-up menus, convenient lookup tables, and context-sensitive help. Solid technical support is a must; most vendors will provide a short period of free support, then charge a flat yearly fee or a percentage of the product cost. You should be able to add more users easily or adapt the program to fit your needs—though you'll probably have to pay extra for custom modifications.

Pricing schemes are generally complex, depending largely on the number of users and types of modules you select. In most cases we have provided price ranges, starting with the cost of the base product or module (such as accounts receivable) for a single user and ending at the cost of all modules for an unlimited number of users. Prices for network versions, where different, are noted.

Vertical software is a large investment, so be sure to get advice from colleagues, trade associations, and industry-specific user groups. If possible, call support lines and check out the quality of service. Have the vendor give you names of customers you can talk to about the product. And be sure to try before you buy.



While most vendors offer "slide show" demo disks, it's better to test-drive a trial version of the package limited to a specific time frame or number of accounts. Vendors sometimes charge from $25 to $100 for trial packages, but they usually credit the cost of the demo if you buy the full-blown program. Spending a little money now can save you big headaches later.

CONSULTING ENGINEERS AND ARCHITECTS

Sweating the details of a project and tracking its costs are daily business for consulting engineers and architects. Most programs are therefore built around project management and accounts receivable modules. The top packages offer an array of powerful accounting modules and let you create links between them, so that entries in, say, the job-costing module also show up in the general ledger. All packages listed here can be used by either engineering or architectural design firms. Key features to look for include the ability to provide cost estimates, analyze staffing needs, produce extensive reports, and prepare proposals.

Acci PMAS

Acci PMAS can help architects and engineers manage a wide array of projects. You can produce invoices and statements and create reports on job cost, work in process, and accounts receivable. A unique "man-hour" feature shows the number of hours scheduled by each class of employee—a good way to gauge staffing needs. Payroll, payables, and general ledger modules are also available. Acci Business Systems, 12707 N. Freeway #140, Houston, TX 77060; 800/448-0601, 713/872-4908 (fax). $2495–$9190 single user, $2995–$10,690 network; free demo disk.

Reader service no. 613

AEasy

Aimed at small design companies, *AEasy* tracks time and billing information, manages retainer fees, provides invoices, and generates project status reports. The *Basic Package* includes a general ledger and report-writing module, while the *Extended Package* adds accounts payable and payroll. Timberline Software, 9405 S.W. Gemini, Beaverton, OR 97005; 503/644-8155, 503/641-7498 (fax). $1390–$1990; demo disk $10.

Reader service no. 614

AEMAS Plus

Comprised of many individual but integratable modules, *AEMAS Plus* is ideal for small firms looking to build a flexible accounting and job-costing system. The menu-driven program lets you post individual entries to multiple modules and export data to popular spreadsheets and word processors. *AEMAS Plus*'s modules help you estimate job costs, schedule personnel, and generate purchase orders. Data-Basics, 11000 Cedar Rd. #110, Cleveland, OH 44106; 216/721-3400, 216/721-2398 (fax). $998–$8982 single user, $1099–$15,291 network; free demo disk.

Reader service no. 615

Micro/CFMS

Micro/CFMS is a fully integrated financial management and project control package aimed at firms of 10 to 30 employees but able to handle unlimited numbers of users. The backbone of the program is its *Project Control* system, which enables you to create progress

and detail reports, analyze time use, track budgets and expenses, and allocate overhead. Additional modules let you plan profits, write reports, and export data to spreadsheets. Harper and Shuman, 68 Moulton St., Cambridge, MA 02138; 800/275-2525, 617/876-2973 (fax). $825–$8125; free trial version.

Reader service no. 616

Professional Accounting and Management System

PAMS is a totally integrated package built with multiple users in mind. Its talents include automated invoicing, project management, and accounting. With its Predictive Project Budgeting component, you can forecast profits on a weekly basis or budget labor hours by project phase. A built-in report generator lets you gauge cash flow and staffing needs, and you can export data directly into *1-2-3* for further analysis. ACS/Informa, 316 Stevens Rd., Santa Barbara, CA 93105; 805/962-4962. $1595–$4500; demo disk $20.

Reader service no. 617

SEMA4 Financial Manager

Semaphore's integrated financial management system helps architects and engineers build their businesses from the ground up. The low-cost *Foundation Package* contains the modules small firms need most, such as job costing, project management, and accounts receivable. The *Advanced Package* includes payables, payroll, and a report generator. Semaphore, Inc., 3 East 28th St., 11th Fl., New York, NY 10016; 800/545-7484, 212/545-7443 (fax). $625–$5490; free demo disk.

Reader service no. 618

System VI

Micro Mode's modular *System VI* helps you track each project's profit level and progress. Its Intelligent Query Report Writer module lets you retrieve and analyze data and print reports and graphs. *System VI* comes with extensive on-line help screens; each module integrates easily into the system. Micro Mode, Inc., 4006 Mt. Laurel Dr., San Antonio, TX 78240; 512/341-2205, 512/697-0489 (fax). $1595–$5880; user guide $50.

Reader service no. 619

Wind-2 Financial Management System, A/E Marketing Manager

Wind-2's menu-based packages let design pros combine high-powered accounting features with a client data base. The financial management pack comes in two versions: The *Business Management* module lets you create invoices, manage projects and employees, track accounts receivable, and analyze expenses. The *Complete System* adds general ledger, payroll, accounts payable, and fixed assets modules. With *A/E Marketing Manager*, you can create a client data base, generate proposals, track prospects, and create management reports. Wind-2 Software, Inc., 1901 Sharp Point Dr., Ste. A, Fort Collins, CO 80525; 800/779-4632, 303/493-4578 (fax). *Wind-2 Financial Management System* $895–$5590; demo version $65. *A/E Marketing Manager* $1895–$2980; demo version $100.

Reader service no. 620

For more information about all products in this section, circle reader service no. 902.

LAW FIRMS

Critical to any legal firm's existence is the ability to manage its caseload. At minimum, case management software should provide a data base for storing all information relating to each case. More sophisticated packages offer conflict-of-interest protection (to ensure the firm doesn't represent opposing parties), an expert-witness data base, and a docketing module for tracking case activity. Most programs include simple word processors for producing standard boilerplate documents, and the better ones link directly to *WordPerfect*.

Equally important to attorneys is time and billing. Features to look for include the ability to produce client statements, adjust billing rates, manage trust accounts, and analyze profitability. If the product provides separate modules for case management and time/billing, they should link seamlessly. Watch for password protection, audit trails, and network features such as file and record locking.

Client Management System

CompuLaw's time and billing package handles up to 4000 clients and 250 billing professionals. Its work-in-process feature enables you to quickly determine current hour and fee totals. There's no network support or case management, but a separate docket module lets you create schedules and calendars. *Legal Ledger*, a general ledger, can be used as a stand-alone module or integrated with *CMS*. CompuLaw Ltd., 3520 Wesley St., Culver City, CA 90232; 800/452-9529, 213/558-3360, 213/558-4486 (fax). $995–$2685; network docket module $495–$4995; free demo disk.

Reader service no. 621

Common-Practice Legal Time and Billing Software

Micro Strategies' time and billing program helps you

IMPACT SOFTWARE'S PROLAW PUTS IMPORTANT CLIENT INFORMATION LIKE BILLING AND PAYMENT DATA AT YOUR FINGERTIPS.

HAVE IT YOUR WAY: DEVELOPING CUSTOM BUSINESS APPLICATIONS

The fantasy runs something like this: You turn on your computer, and up pops a brilliantly designed package with thoughtfully placed pop-up menus, full mouse support, and compelling reports. Everything you need to do to run your business, it does—effortlessly. Of course, you can customize it at a moment's notice.

Sound too good to be true? It is. Yet that's what many people expect when they hire a programmer to create custom software for their business. Translating your ideas into a workable program can be a time- and money-consuming process. A good dBASE programmer will run from $65 to $100 an hour, and even a relatively simple programming job can take 40 to 60 hours.

That's why many users opt for an existing vertical package. Vertical software is usually stable and bug-free. Once you get past the learning curve, you can use it right away. And if you need minor modifications, most vendors will customize their packages for an additional fee.

Still, vertical programs are fairly limited in the kinds of changes they allow. If you can't find a package that has all the features you need, or if you want one you can easily modify later on as your business grows, hiring a programmer is your best choice. Here are a few tips to guide you along the path to software salvation.

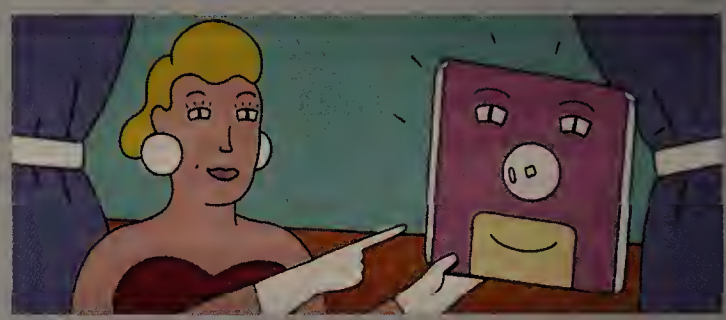
Getting a programmer to write your dream software is like hiring a contractor to remodel your kitchen. There are three rules: (1) It always takes longer than you think; (2) it'll need to be tweaked because you'll want "just one more change"; and (3) it'll cost more than planned because of the tweaks.

The crucial issue, according to Advanced Data System's Ken Green, a Southern California *FoxPro* programmer, is determining exactly what the software has to do. "Without a comprehensive list," says Green, "you can't make the decision [to choose a custom program] or even be in the position to evaluate the software."

Once you've decided on a custom-made system, you need to pick a programmer. First, get a list of recent clients, and ask them about their experience with the programmer. Then, ask for the names of at least three established applications, and either try them yourself—most programmers will lend you a copy—or visit the installed site. Finally, demand a reasonable schedule from the programmer, but be flexible when you ask for changes. If he or she regularly misses deadlines, however, it's a sure bet the software will be just as disorganized.

It's important that you get a contract, even if the programmer is your brother-in-law (*especially* if he's your brother-in-law). Have an attorney who specializes in the field put together an agreement laying out the project, the time parameters, and the payment schedule. Ideally, there won't be any disagreements, but it's a good idea to specify the resolution process in the contract. "Binding arbitration is usually the best choice," says California attorney James Wiens. "It's generally quick and cheap."

Another issue is determining who owns the source code, the language that guides your software. Generally, it's a good idea to own the code, in case you need to alter the program later and the original programmer is unavailable. If you decide you want to sell your custom-made package as a vertical system (where do you think these things come from, anyway?), you'll need to cut a royalty deal with the programmer. In any case, it's best to iron out the rules with an attorney by your side.



The next step is listing the specific tasks you'd like the software to accomplish. Ideally, the program should work the way you do. But, remember, even the world's greatest programmer doesn't know your business—you need to explain everything. As each feature will add to the cost, decide what features you must have, and what you can live without.

Most users know what they want but, unaware of program design rules, ask for features that conflict with each other. "On one hand, customers want infinite flexibility for changing data," says Green. "At the same time, they want rigid rules to ensure an order is entered according to their specific business procedures."

After the software is delivered, get ready for what Green terms the "disappointment phenomenon." That's when you realize that the long-awaited solution to all of your business problems...isn't. Resist the temptation to stuff the programmer into the nearest floppy drive. Remember, no software, not even an expensive commercial product, satisfies every user.

Choosing between vertical and customized software is mostly a question of time and money. Only after careful deliberation, rigorous examination of trial software, and thorough interrogation of former customers will you be able to make the decision. And even then, it's a tough one. —*S. B.*

STEVEN TURK

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Reader service no. 622

InnerTrack V

InnerTrack V provides a host of case and financial management modules that can run as stand-alone programs or be integrated. A broad range of accounting options, plus *Conflict of Interest* and *Bank Reconciliation* modules, are available in single-user and LAN versions. A *Docket/Calendar* module lets you use Boolean logic for text searches and helps prevent appointment conflicts. Libra Legal Systems, 4547 Rte. 9 N, Howell, NJ 07731; 800/323-0714, 908/370-4500, 908/370-4446 (fax). $395–$7299 single user, $1595–$13,199 network; trial version $35.

Reader service no. 623

Juris

Juris's modular approach lets users choose just the features they need—such as *Conflict Avoidance, Trust Accounting,* and a variety of accounting options. But you must first install *Juris*'s core *Time and Billing* program for these modules to work. The menu-driven program supports unlimited billing formats, rates, and clients. The stand-alone *Docket and Case Management* module lets users in networked law firms send memos via E-mail or append them to a printed calendar report. Juris, 151 Athens Way, Nashville, TN 37228; 615/242-2870, 615/256-2053 (fax). $1800–$9900 full product, $2700–$14,200 network; free trial version.

Reader service no. 624

PCLaw

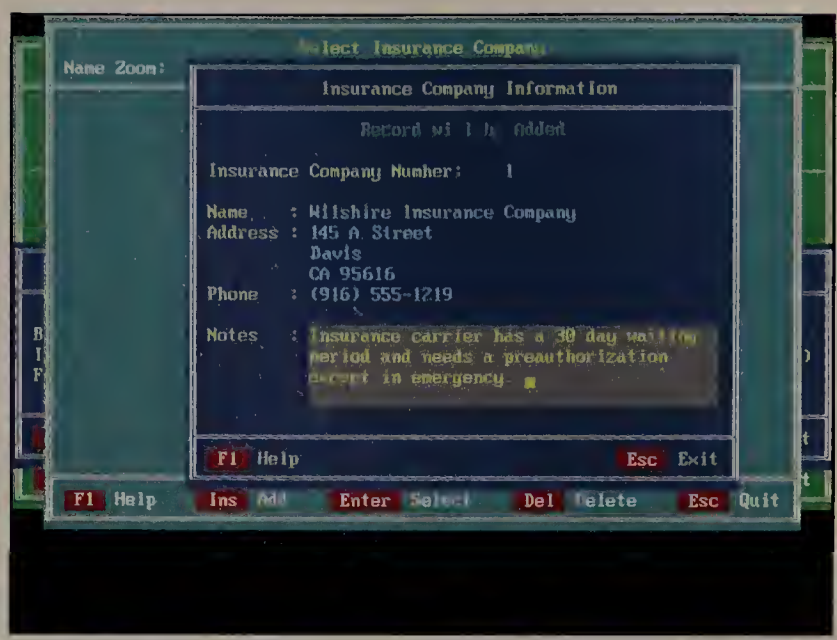
PCLaw's fully integrated office system performs time and billing, tracks receivables, handles trust money, prepares financial statements, and offers complete management reports. The fully networkable system supplies a tickler file, accounts payable with check writing capabilities, a general ledger, and the ability to perform mortgage amortizations. Alumni Computer Group, Ltd., 155 N. Michigan Ave. #722, Chicago, IL 60601; 800/387-9785. $1995–$3495; free demo disk.

Reader service no. 625

TABS III

TABS III enables legal professionals to record billable and nonbillable time with disbursements divided into expenses and advances. In addition, you can track work in process, manage accounts receivable, and generate productivity reports. Also included are add-on modules *Case Master III,* a case manager that offers document generation, conflict of interest, statute of limitation, and calendaring features; general ledger and accounts payable modules; and *Critical Date System,* a docket and calendaring manager. Software Technology, 1621 Cushman Dr., Lincoln, NE 68512; 402/423-1440, 402/423-2561 (fax). $1750–$4995 single user, $2995–$4995 network; free demo disk.

Reader service no. 626



NORTHWEST TRAINING PROGRAMS' THE THERAPIST OFFERS A HANDY NOTES FEATURE TO HELP EASE THE PAIN OF SUBMITTING INSURANCE CLAIMS.

TimePiece Legal, ProLaw, ProLaw Platinum

TimePiece Legal is a stand-alone time and billing package that provides flexible billing statements, ten billing rates for an unlimited number of professionals, and a built-in word processor. The program offers links to the SBT series of accounting software and provides direct access to *WordPerfect. ProLaw* combines *TimePiece*'s time and billing features with the ability to manage files and documents, distribute partner income, and design reports. Both *TimePiece Legal* and *ProLaw* come in single- and multiuser versions. *ProLaw Platinum* offers the same features as *ProLaw* but is designed for LAN-based firms with 25 or more attorneys. Impact Software Production, P.O. Box 20628, Albuquerque, NM 87154; 505/828-0638. $895–$4270 single user, $1295–$8995 network; free demo disk.

Reader service no. 627

For more information about all products in this section, circle reader service no. 903.

MEDICAL–DENTAL–PSYCHOLOGICAL

Practice management for the health-care professions consists primarily of tracking patients, mailing statements, and churning out endless insurance claim forms. Your choice should offer basic accounting functions, record patient and provider productivity reports, and provide lookup tables for industry-specific diagnostic and procedure codes. Other features to watch for are appointment and scheduling modules and the ability to track insurance company histories.

Insurance is usually the biggest hassle heath-care workers face. Look for a package that can support a variety of standardized insurance forms—including the AMA, 25M, and HCFA 1500 reimbursement forms—that you can fill in on screen. Nice extras include laser printer support and the ability to submit forms via modem to a third-party clearinghouse (such as GTE), which passes the data on to the insurance carrier. Such firms help speed up reimbursements but usually

charge processing fees.

Group practices need to look for password protection and network capabilities. Besides the features found in medical packages, most dental packages add features specific to dentists' needs, such as pretreatment authorization and additional insurance forms. Psychology programs usually include specific diagnostic code lookup fields.

STEVEN TURK

Cactus/MD, Cactus/DDS

Cactus/MD's strengths are managing medical histories, tracking accounts receivable, and handling insurance claims. The *Medical Records* module allows you to record progress notes, drug history, lab information, and physical exam data. *InSure/Link* lets you submit insurance claims via modem, while *CodeLink* provides procedure and diagnostic codes in pop-up windows. *Cactus/DDS* comes with all of the above, plus a module for recording tooth and surface data and the ability to handle five-digit ADA codes. The Cactus Group, 103 W. Main St. #406, Durham, NC 27701; 800/877-9495. $2495–$6380 single user, second workstation $1500, each additional workstation $500.

Reader service no. 628

CompuMedic, DentalWare

CompuMedic fully integrates general ledger, accounts receivable, word processing, and insurance processing features. You can customize reports, export data to programs like *WordPerfect* or *dBASE*, and submit insurance forms via modem. *DentalWare* provides the same features, plus an automatic recall function for sending patient reminders. Data Strategies, 15373 Innovation Dr. #210, San Diego, CA 92128; 619/451-0480, 619/451-0080 (fax). $5600–$7600; free trial version.

Reader service no. 629

Medical Practice Manager, Dental Practice Manager

Pacific Medsoft's two packages are similar yet each is specially designed for a specific type of practice. In addition to providing built-in accounts receivable and insurance billing features, both programs let you enter clinical data and produce statements, reports, mailing labels, mail-merge letters, and insurance forms. The program offers optional accounting modules, electronic claims submission, and appointment schedulers for single-user and multiuser offices. Pacific Medsoft, P.O. Box 7049, Tahoe City, CA 95730; 800/343-5653, 916/583-1532 (fax). $3995–$6927 single user; $5495–$12,278 network; trial version $25.

Reader service no. 630

Med#1, Dental#1

Medshare's low-cost *Med#1* and *Dental#1* office management programs are available as try-before-you-buy shareware (limited to 100 accounts). The full-sized packages let you set up 99,999 accounts with up to 100 patients per account. You can generate reports on daily charges, receipts, receivables, and patient profiles and quickly search through accounts, patients, charge code, and insurance companies. The programs lack appointment modules and LAN versions. Medshare, 4100 W. 15th #103, Plano, TX 75093; 800/233-0560. $395 each; trial version $10.

Reader service no. 688

Medpac, Dentpac

Medpac is a complete receivables accounting system that integrates with *Accpac Plus*'s optional general ledger module. The package maintains patient files, monthly statements, and insurance forms, and links directly to *Microsoft Word*. It provides electronic claim submission through GTE's on-line medical claims clearinghouse. *Dentpac* is similar except that it lets you record tooth and surface information and preauthorizations. Syscon Computers, 94 McFarland Blvd. N, Northport, AL 35476; 800/543-3767, 205/758-2000, 205/345-5525 (fax). *Medpac* $3495, $695 each additional 4 workstations; *Dentpac* $2995, $695 each additional 4 workstations; no demo disk.

Reader service no. 631

PBS 2.1

PBS 2.1 combines the features psychotherapists need most, maintaining client records, billing patients and insurers, and generating reports. The program is designed for quick data entry—for example, both charges and payments appear on one screen—and provides customizable lookup tables for most data fields. A built-in forms generator makes it easy to create insurance forms and statements. A unique feature lets you separate client and insurance company charges. Blumenthal Software, P.O. Box 138, SVS, Binghamton, NY 13903; 607/724-0032. $500; free trial version.

Reader service no. 632

PsyC

PsyC is a complete practice management program providing full, customizable LAN support. All users need do is keep their appointment books accurate and enter payments; *PsyC* does the rest, generating bills, bank deposit slips, financial reports, insurance statements, and client data. Procedure and diagnostic codes, with descriptions, are available through pop-up windows. There's also a forms design program and insurance templates. NARDO.SYS, 3179 Peachtree Rd. #200, Atlanta, GA 30305; 404/261-1866. $500; free demo disk.

Reader service no. 633

Shrink Direct, Shrink 3.0, Shrink Plus

Multi-Health Systems' trio of products is designed to meet the needs of both large and small practices. Each version provides billing, accepts multiple practitioners, and produces reports on aged accounts receivables. *Shrink Direct* is aimed at solo or small practices that need to bill patients but not insurance companies. *Shrink 3.0* adds expense tracking, customizable statements, and completed insurance forms. *Shrink Plus* incorporates an appointment scheduler and lets you write clinical records and progress notes. Multi-Health Systems, 908 Niagara Falls Blvd., North Tonawanda, NY 14120; 800/456-3003, 416/424-1736 (fax). $395–$995 single user, $1595–$2195 multiuser; trial version $35.

Reader service no. 634

The Therapist

A low-cost program that matches many features found in high-priced packages, *The*

Therapist tracks a variety of information about patients, such as referral sources, payments, insurance carriers, and diagnoses. The program simplifies data entry with point-and-shoot lookup tables with almost unlimited report generation. Northwest Training Programs, P.O. Box 175, Salem, OR 97308; 503/370-7706, 503/838-2633 (fax). $139; trial version $15.

Reader service no. 635

Therapist Helper

Like a good therapist, Brand Software's *Therapist Helper* is friendly and supportive. The menu-driven program offers novice practioners all the basic practice management and patient scheduling features, with flexible, user-configured defaults. An optional module supports multiple therapists. Brand Software, 11 Menocker Rd., Chestnut Ridge, NY 10952; 800/343-5737. $400–$1090; free trial version.

Reader service no. 636

TPPM–The Psychotherapy Practice Manager

TPPM is an inexpensive way to handle billing, manage appointments, and maintain client records for small to medium-sized practices. It comes with an appointment scheduler and address book; an optional module lets you track expenses and produce accounting reports. Radding and Watson, 78 N. Wake Forest Ave., Ventura, CA 93003; 800/835-2246 ext. 41, 805/644-4354 (fax). $295 single user, Revenue and Expense module $95; trial version $20.

Reader service no. 689

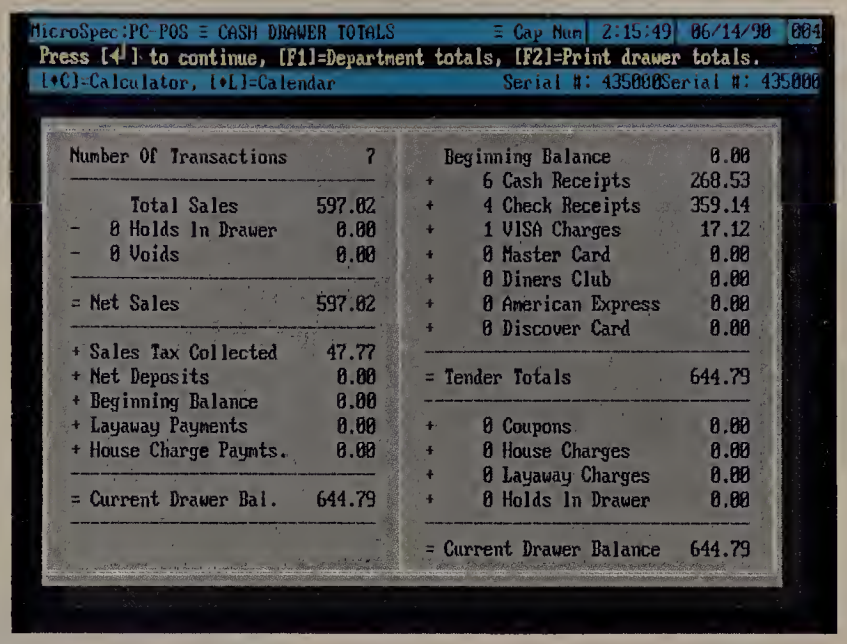
For more information about all products in this section, circle reader service no. 904.

STEVEN TURK

POINT OF SALE

In the old days, a cash register was enough. Nowadays, retailers want better control of their business—with inventory management, financial statements, and customer tracking. Point-of-sale (POS) software can supply that, and a lot more.

POS programs let you track sales and customer information and generate reports on topics such as marketing information and sales tax collected. Because users who enter the sales transactions are often entry-level workers, ease of use and error trapping are musts. Look for flexible handling of inventory (a program that can note, for example, different colors or weights), plus the ability to add new inventory and to change tax or discount rates on the fly. Finally, the system should allow you to add hardware as needed—bar code readers, laser scanners, cash registers, receipt printers.



NEED TO KNOW THE TOTAL RECEIPTS FOR THE DAY? MICROSPEC'S PC-POS KEEPS YOU POSTED WITH UP-TO-DATE NUMBERS.

CCS POS

Although *CCS POS* works as a stand-alone program, it was designed to work with SBT's optional accounts receivable and general ledger modules. The program handles multistore operations and up to seven types of payments, including food stamps and debit cards. The assortment of reports includes cash-drawer status, payment transactions, and price lookups. TABS (Technologically Advanced Business Systems), 1239 E. Newport Center Dr. #111, Deerfield Beach, FL 33442; 305/570-8388, 305/570-8377 (fax). $1295–$15,950; trial version $40.

Reader service no. 637

Department Point of Sale

At the center of Freeman Software's POS program is a combination of inventory control, report printing, basic purchase-order generation, and customer checkout features. The system handles up to 20 separate departments, four sales-tax rates, and 30 salespeople. The invoicing feature integrates easily with optional *Accounts Receivable* and *General Ledger* modules for detailed reports. Freeman Software, 334 Fieldside Dr., Garland, TX 75043; 800/426-6598. $189 single user, $495 network version; free trial version.

Reader service no. 638

Keystroke POS

Keystroke POS lets small-to-midsized shops create sales invoices and purchase orders and track customers, inventory, and receivables. Screen layouts, labels, and forms are easily customized. The program has a pop-up calculator and links to Manzanita Software's *BusinessWorks Integrated Accounting System.* Specialized Business Solutions, 215 Long Beach Blvd. #523-43, Long Beach, CA 90802; 800/359-3458. $695–$995; demo disk free.

Reader service no. 639

PC-POS

PC-POS is designed with the retail sales counter in mind. It delivers quick, easy data entry with plenty of context-sensitive help and pop-up windows. You can track inventory, maintain vendor and employee

data, calculate commissions, and generate sales and inventory analysis reports. The system can readily add an array of optional equipment, and store-to-store connectivity is available with an add-on module. MicroSpec, 840 E. Central Pkwy. #100, Plano, TX 75074; 800/451-3363, 214/423-4979. $995–$2645; trial version $39.95.

Reader service no. 640

For more information about all products in this section, circle reader service no. 905.

REAL ESTATE

Property management packages help you maintain data on commercial, residential, and retail properties—a way to keep track of ongoing sales while "farming" new markets. All programs supply statistical and financial data, calculating, for example, rent escalations, percentage of common costs, and lease options due. Most have accounting features built in, while others have easy links to stand-alone financial packages. Look for flexible report generation and the ability to add unique properties.

Investment Property Management

Realty Automation's software integrates accounting and property management. You can track information on tenants, vendors, and owners and such diverse properties as stables, marina berths, and condominiums. Custom reports can be generated along with checks, labels, and letters. Realty Automation, 11365 Eastshore Dr., Hayden Lake, ID 83835; 208/772-3259. $795–$1750; trial version $30.

Reader service no. 641

Property Management Plus

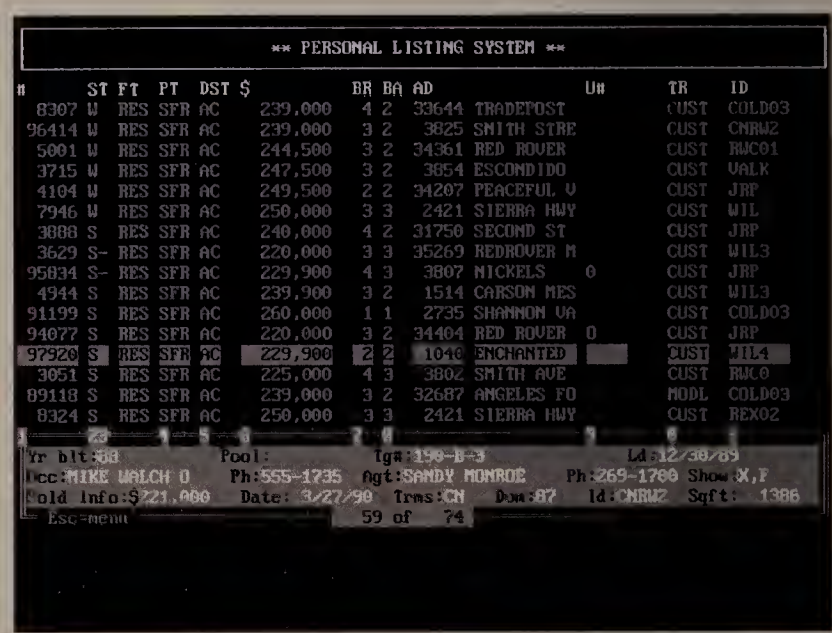
In addition to traditional real estate features, *Property Management Plus* generates graphs of income and expenses, easy bank reconciliations, detailed vacancy reports, and bank deposit slips. The *Management Option* lets you produce 1099 forms and balance sheets, calculate tenant deposit interest, and determine management fees. It also organizes addresses, phone numbers, tax ID numbers, and other information. Realty Software Co., 133 Paseo de Granada, Redondo Beach, CA 90277; 213/372-9419, 801/649-6149. $575–$1275; trial version $25.

Reader service no. 642

The Property Manager

The Property Manager handles accounting details at three levels: properties, buildings, and units. You can generate automatic invoices for rent and other recurring charges, plus reports on financial and statistical rent data, occupancy and vacancy status, and rental increase notices. The program integrates with *Accpac Plus*'s accounts payable, job costing, and general ledger modules. L&L Services. 102E Centre Blvd., P.O. Box 346, Marlton, NJ 08053; 800/544-7890, 609/983-4477. $1995–$2390; trial version $100.

Reader service no. 643



THE REAL ESTATE SPECIALIST LETS YOU VIEW ALL THE PROPERTY LISTINGS FOR A PARTICULAR PRICE RANGE AND DISTRICT AND GET INSTANT DATA ON THE BUYER, BROKER, AND PRICE.

REMS Property Manager 500

Good Software's unique *Windows*-based program lets you track repair requests and progress, generate billing and late notices, and automatically compute rent increases. The LAN-compatible *REMS* provides double-entry accounting with General Ledger, Accounts Payable, and Tenant Receivables modules. Good Software, 13601 Preston Rd. #500W, Dallas, TX 75240; 800/272-4663. $595–$2495, (network); trial version $50.

Reader service no. 644

The Real Estate Specialist

Primarily a marketing tool for tracking customers and properties, *The Specialist* maintains records of listings, descriptions, closings, rentals, and leases. You can create to-do lists and schedules and print mail-merge letters, labels, and envelopes. An auto-dialer aids in telemarketing. Hibbs Henle Nelson Corp., 1115 Foothill Blvd., La Canada, CA 91011; 818/952-1000. $598; trial version $25.

Reader service no. 646

Your Real Estate Partner

Your Real Estate Partner helps investors, home owners, and real estate pros financially analyze properties. You can determine monthly and yearly expenses, establish rate/point combinations, and project resale profit or loss. However, this low-cost program is copy protected. Niche Software, 2327 N. Southport Ave. #100, Chicago, IL 60614; 800/552-5477. $69.95; no trial version.

Reader service no. 647

For more information about all products in this section, circle reader service no. 906.

STEVEN TURK

Why FastData?

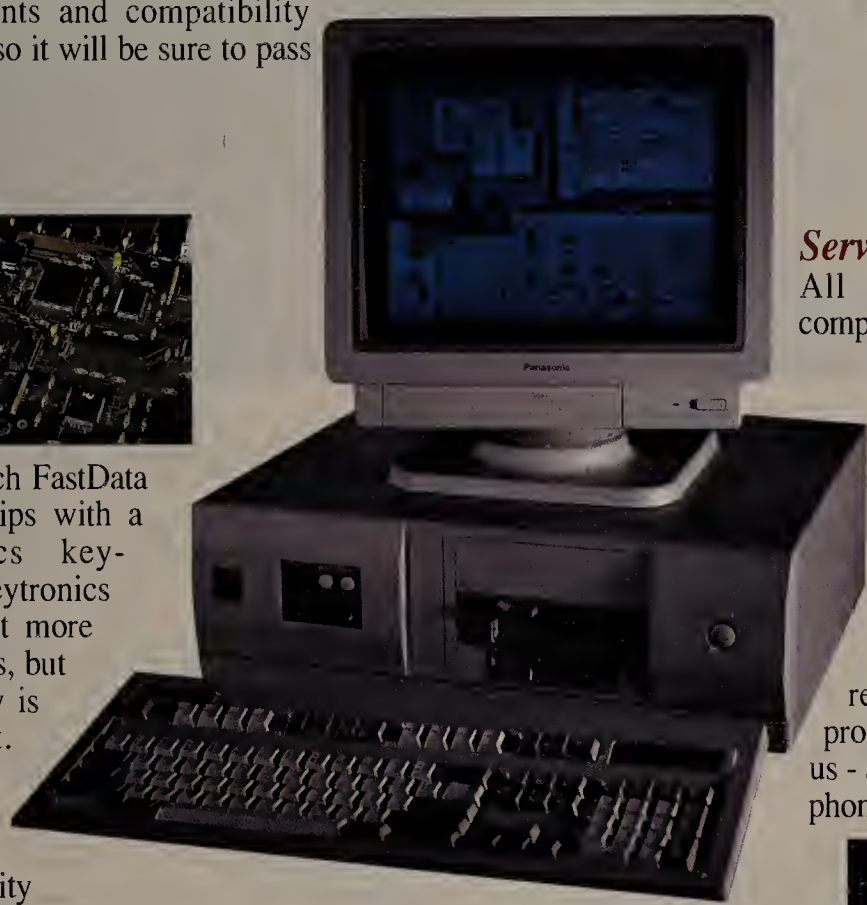
A personal computer is a large investment; before you choose, we want you to know what to expect when you purchase a FastData personal computer from FastMicro.

Superior Design.

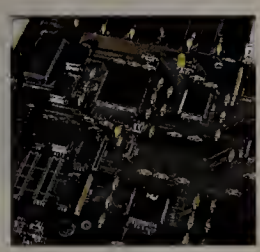
You get more out of your FastData personal computer because we put more into it. We've been building PC's longer than most of the competition and we put that experience to work for you. We use proven designs that pass our stringent performance requirements and compatibility standards so it will be sure to pass yours.

Full Support.

Our team is standing by and ready to make your FastData computer perform to its greatest potential for you. When you buy a FastData computer, you're covered by Toll-Free technical support for life. And since we sell more software than other computer companies, we are uniquely qualified to give the proper support the customer deserves.



Better Components.



The whole is only as good as the sum of its parts; and FastData systems use some of the best parts in the industry. For example, each FastData system ships with a Keytronics keyboard; Keytronics costs a lot more than others, but the quality is worth it.

Our systems use exclusively Toshiba floppy drives, the industry leader. Standard equipment includes other quality components from Western Digital, Phoenix, Chips & Technologies, just to name a few.

Service.

All FastData personal computers come with a full one year warranty, but that's just the start. In the unlikely event your computer is down, it is our goal to get back up and working as quickly as possible - and we back it up with action. Call us toll-free and we'll work with you to determine the problem; if a part breaks, we will send you the replacement part through our FastSHIP program - before the broken part is returned to us - and we'll pay the freight both ways. If our phone support or FastSHIP program can't solve your problem, we will service it on-site to most U.S. locations or replace your computer at no charge. Now that's service.

Selection.

Our face to face retail background has made us never forget that the customer comes first and that a personal computer is just part of a customer's overall needs. That's why FastMicro offers thousands of hardware and software products to enhance your new personal computer. In fact, our competition will probably tell you to call us when you need something to run on their personal computer.

Risk Free.

We pass the test for the choosiest of customers; in fact, FastMicro sells to over half of the Fortune 500 and Universities in 47 states (we're working on the rest). These people buy for a living and rely on us, you can too. You can do more than take our word on it - go ahead and purchase any FastData brand product from FastMicro and if you are not thoroughly satisfied after 30 days, you can return it for a full refund of the purchase price.

FastData 386 Systems

FastData 386/33 $2399

The fastest 386 processor available combined with a 64K thirty nanosecond memory cache make the FastData 386/33 a power users dream! Included in the base price is a 100 megabyte 20 millisecond hard disk, 1024 by 768 VGA monitor and card, four megabytes of memory, and 5.25" & 3.5" high capacity floppy drives. Plus, should anything ever go wrong with your FastData computer, you are covered by a one-year warrantee with free on-site service or system replacement if we cannot correct the problem with our FastSHIP advance parts replacement program.

Standard Features

- ✓ 33mhz Intel 386-DX processor.
- ✓ 64K high-speed memory cache.
- ✓ 4 megabytes RAM.
- ✓ 100 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Full size (shown) chassis with keylock, speed and reset buttons.
- ✓ 387-DX coprocessor socket.
- ✓ 230 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, game port and two serial ports.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots & 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ FCC Class B approved.

System Price	65mb	80mb	100mb	200mb
Monochrome	$1,799	$1,929	$1,999	$2,499
VGA Color	$2,099	$2,229	$2,299	$2,599
VGA 1024	$2,199	$2,329	$2,399	$2,699

FastData 386/25 $1999

The optimum combination of features, expandability, and power make the FastData 386/25 an ideal choice for those whose applications demand high speed 32 bit processing and expandability. The value of the 386/25 goes far beyond its price; it comes configured with a a full four megabytes of fast RAM, a quick 22 millisecond 65 megabyte hard disk, and maximum VGA displaying 1024 by 768 resolution powered by a high-output 16 bit 512K VGA board. Also, the FastMicro team will configure your FastData 386 exactly the way you want, without sending you shopping elsewhere.

Standard Features

- ✓ 25mhz Intel 80386-DX.
- ✓ 4 megabytes of zero wait-state RAM.
- ✓ 65 mb 22ms RLL hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. (For both add $69)
- ✓ Standard chassis (shown on left) with keylock, speed and reset buttons.
- ✓ 80387-DX coprocessor socket.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots & 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Guaranteed compatible.
- ✓ FCC Class B approved.

System Price	65mb	80mb	100mb	200mb
Monochrome	$1,599	$1,729	$1,799	$2,099
VGA Color	$1,899	$2,029	$2,099	$2,399
VGA 1024	$1,999	$2,129	$2,199	$2,499

FastData 486/25

Call about our hot new 486, just $3,199 with the same standard features as our 386-33 system. Includes a 128K two-stage cache and is expandable to 64mb of memory.

All FastData Systems Include:

- 30 day money- back guarantee
- Toll-free technical support for life
- One year warrantee with on-site service available to most U.S. locations

FastData SX Systems

$1599 FastData SX/20

25% faster than a 16mhz SX, the FastData SX/20 adds even greater performance to its 386 multitasking capabilities. Just $200 more than our SX/16, this machine also includes a second floppy drive in addition to the standard VGA color monitor and 16 bit VGA adaptor, Keytronics keyboard and 40 megabyte hard drive. The system includes two megabytes of memory and is expandable to eight on the main system board. Remember, when you have questions, need to solve a problem, or want recommendations on products for your system, the FastMicro team is standing by toll-free to provide product support for as long as you own your FastData personal computer.

Standard Features

- ✓ 20mhz Intel 80386-SX processor.
- ✓ 2 megabytes of zero wait-state RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown) with keylock, speed and reset buttons.
- ✓ 200 watt power supply
- ✓ 14" VGA color monitor with 16 bit VGA card with 256K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Guaranteed compatible.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$1,299	$1,369	$1,499	$1,569
VGA Color	$1,599	$1,669	$1,799	$1,869
VGA 1024	$1,699	$1,769	$1,899	$1,969

$1399 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and also want to run their favorite DOS applications at surprising speeds. We've made our customers' favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit color VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel 80386-SX processor.
- ✓ 2 megabytes of zero wait-state RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. Both drives add $69.
- ✓ Standard chassis with keylock, speed and reset buttons (mini desktop shown - add $50).
- ✓ 200 watt power supply
- ✓ 14" VGA color monitor with 16 bit VGA card with 256K.
- ✓ Clock calendar, parallel port, two serial ports, and a game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ Guaranteed compatible.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$1,099	$1,169	$1,299	$1,369
VGA Color	$1,399	$1,469	$1,599	$1,669
VGA 1024	$1,499	$1,569	$1,699	$1,769

FASTMICRO

For information or to order call:

1-800-441-FAST

Circle 100 on reader service card

FASTMICRO Hardware 1-800-441-FAST

DISK DRIVES

Colorado DJ-10 40-120mb Int. Tape 249
DJ-20 80-240mb Int. Tape 319
Conner *(see IDE controllers below)*
CP3044 40mb IDE 28ms 269
CP3104 100mb IDE 25ms 499
CP3208 200mb IDE 25ms 849

Seagate 89mb AT Kit $399

IDE performance, big 89 megabyte capacity and Seagate quality make this kit a great buy. A 19ms access time and 5 mbps transfer rate assure great performance. Controller, cables and rails are included to make installation fast and easy.

Micropolis
MC1664 340mb ESDI 14ms 1295
MC1598 1.2gb SCSI 14ms 2895
NEC CDR-3501 Ext. CD-ROM w/interface 549
Plus Development
HardCard IIXL 50 - 52mb 9 ms 16bit 399
HardCard IIXL 105 - 105mb 9 ms 16bit 679
Impulse 42mb 12 ms 16bit IDE Kit 399
Impulse 105mb 9 ms 16bit IDE Kit 599

Toshiba 1.44mb Floppy Drive $69

Complete with mounting brackets and installation instructions, this Toshiba works in all true 286 & 386 compatibles. Will also read/write/format 720K 3.5" disks. Rails, add $5.

Seagate
30MB XT Kit ST238 w/ cont. 249
40MB AT ST251-1 MFM Drive 239
40MB AT ST157A 28ms IDE Drive 199
80MB AT ST296N SCSI Drive w/adaptor 349
89MB ST1102A 19ms IDE Drive 359
125MB ST1144A 19ms IDE Drive 469
210MB ST1239A 15ms IDE Drive 799
330MB ST2383E 16ms ESDI Drive 1289
Teac
1.2MB 5.25" Floppy 65
1.44MB 3.5" Floppy 65

Toshiba 100mb IDE Kit $489

Upgrade your 286 or 386 to IDE technology and Toshiba quality at a FastMicro price. This kit comes with a fast 20ms 105mb drive and built-in 1:1 controller, 16 bit IDE card with dual floppy controller and cables, 5.25" brackets and rails. Call our experts for all your drive needs. Model MK234FC.

Toshiba
360K 5.25" Floppy (Black) 69
1.2MB 5.25" Floppy 69
1.44MB 3.5" Floppy 69
65mb MK134 22ms RLL drive 279
100mb MK234FC IDE 3.5" drive 449
Western Digital
WD 16 bit IDE Host - with dual floppy controller 39
WD93044 40mb IDE 28ms 199
WDAC280 80mb IDE 28ms 339
WE1007V-SE2 ESDI AT 1:1 dual controller 149

Sun Moon Star CD-ROM Drive $549

Affordable CD-ROM technology is here! This player reads over 600mbs from just one CD and can even play your favorite audio CDs. Using a high quality Hitachi mechanism, it comes with a cable, interface and 18 month warrantee. Add an Illustrated Encyclopedia CD for $49.

BOARDS

Artisoft/Lantastic
Lantastic 2mbps Starter Kit - Two Station 369
Lantastic 2mbps Adaptor 169
Lantastic Ethernet Starter Kit - Two Station 499
Lantastic Ethernet Adaptor 239

ATI VGA Wonder + $189

New and improved, the ATI VGA *WONDER+* is faster than VRAM. It does interlaced and non-interlaced 1024x768 modes, is 100% register compatible, and comes with extensive software drivers. A free mouse is included as an added bonus. 512K version $219.

ATI
2400 ETC Internal ..... Call
2400 ETC External 187
9600/E External MNP V.42bis 479
VGA Basic 16 75
VGA Wonder + 256K 189
VGA Wonder + 512K 229
Brown Wagh Sound Blaster 149
Everex
2400B Int Modem 99
EGA 480 Card 69
RAM3000 16 bit RAM card 75
RAM8000 16 bit RAM card 169
Hayes
JT FAX 4800B Internal 139
Personal Modem 2400 w/Prodigy 119
Hercules Graphic Card + ... 169
Intel
Classic 2400 Modem Int./Ext. 137/167
Satisfaxtion Classic - Internal 9600 379
8087-2 115
287XL 199
387-DX25 479
387-SX16/20 ..... 319/349
Logitech
ScanMan Plus 165
Scanman 256 289
Orchid
ProDesigner II 512/1mb 279/329
Tiny Turbo 286 207
Tiny Turbo Xtra 267

Practical Modem 9600SA $449

This external modem features V.42 and MNP error correction combined with MNP/5 and V.42 bis data compression to provide total high speed throughput. The PM9600SA is also V.32 TCM, V.32, V.22 compliant and comes with a five year guarantee.

Paradise
Basic VGA - 8 bit 109
VGA 1024 256K/512K 175/199
Practical Peripherals
2400B Int Modem 125
2400B Int with MNP 169
PM9600SA Ext. V.32/V.42bis 449
Prometheus
Promodem 2400B Internal. 98
Promodem 2400G External 149
USRobotics
2400 Sportster Int/Ext. 119/147
2400 Sportster Int/Ext. 159/199
Courier HST 14,400 /Int.Ext. 539/579
Courier HST 14,400 Dual Standard Ext. 859
Video 7
VGA 1024i 256K 179
VGA 1024i 512K 209
V-RAM VGA 512K 299
ZOOM
HC2400 Internal 79
2400 V.42bis External Modem 169
9624 Send/Receive Internal Fax Modem 129

MONITORS

Mitsubishi
1410 EGA 325
Diamond Scan 1381 479
NEC
Multisync 2a 469
Multisync GS 2a 199
Multisync 3d 629
Multisync 4d ..... Call
Panasonic C1381 VGA 439
Princeton ..... Call
Seiko CM1440/1450 ..... 519/659
Sony 1304 Multiscan 669
Zenith 1492 ..... Call

FastData Products

FastData 16 Bit VGA

The FastData 16 bit VGA card features 256K of video memory, does CGA, EGA, & VGA up to 1024x768 and comes with drivers for popular software including Windows 3.0. It's expandable to 512K and has a 30 day money-back guarantee. $89 256K Vers. $119 512K Vers.

FastData 16bit 1mb VGA 159
FastData CGA Card 35
FastData MGP Card 29

FastData 2400 Baud Internal Modem $69

The FastData 2400 baud internal modem is fully Hayes compatible and can be configured to COM port 1-4. It has an internal speaker, is auto answer & auto dial, and comes with BitCom software.

9600B SendFax w/ 2400B Modem 99
MFM 16 Bit 1:1 Hard/Floppy Disk Cont. 59
Parallel/Dual Serial/Game Card 29
RLL 16bit 1:1 Hard/Floppy Disk Cont. 69
XT 1.44 Dual Floppy Controller 35

FastData Monitors

Your best value, we have a complete line made for us by leading manufacturers like Samsung & Hyundai. Like all FastData products, you have a full 30 day money back guarantee. Shown is the VGA Color for $279.

FastData Monitors
12" Amber Monochrome 79
14" Amber Monochrome 109
14" White Monochrome 109
14" White VGA Monochrome 129
14" CGA Color .52 dot pitch 199
14" VGA Color .39 dot pitch 269
14" VGA Color .31 dot pitch 319
14" Super VGA 1024 x 768i .28 dp. 349

PRINTERS

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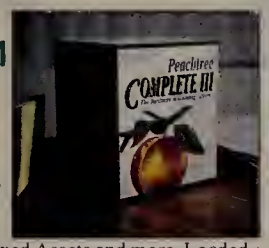

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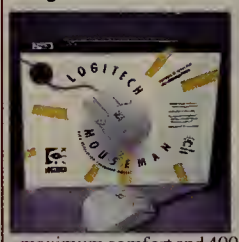

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LAPTOPS CLOSE THE DEAL

SHARON LYNNE FISHER

When Wolverine World Wide told its salespeople to "get a SHINE," the 108-year-old company, best known for its line of Hush Puppies, wasn't asking them to polish their footwear samples. Rather, SHINE (Shoe Information Network) is the name the Rockford, Michigan–based Wolverine—which sells shoes, boots, gloves, and other outdoor products—gave its laptop and minicomputer network. The system has reduced by 90 percent the turnaround time for fulfilling shoe orders to retail stores, saved sales representatives hours of paperwork, and helped the reps keep track of order status.

"The shoe business is a service business," notes sales representative Bob Marcum. "Wolverine sells more shoes by making sure that stores have stock on hand. The quicker you can get shoes to the stores, the quicker they can be sold."

But the associated paperwork took quite a chunk of a sales rep's time—some 10 to 12 hours per week, says Richard Lizotte, an account executive in Sarasota, Florida. So the paperwork was often left for times when sales reps were not out selling—usually weekends—and that delayed orders.

Researching the status of orders was another onerous task. Checking on the fate of a single unfulfilled invoice, for example, might require a minimum of 15 to 20 minutes on the phone while the customer service rep at headquarters looked up the information. "Most of the sales reps just didn't do that," says George Hanson, Wolverine's system manager. As a result, reps often came to sales calls unprepared to answer shipping questions, and customer service suffered.

AN OPERATIONAL OVERHAUL

Wolverine clearly needed to streamline its order entry and sales support. Much of the data salespeople needed about accounts receivable, accounts payable, credit lines, customer profiles, order status, shipment dates, and so on was already stored on the corporate data base (now on an IBM AS 400 minicomputer). But Wolverine had no way to distribute that data to sales reps in a timely fashion. The company also wanted an automated method for collecting orders from reps.

When Hanson began researching off-the-shelf software, he found that the only method available for routing the necessary information was via attachments to electronic mail files. "We would have had to go in manually, create a dummy memo, and attach the messages by hand," Hanson explains.

To obtain a completely automatic system, Hanson had to develop SHINE in-house. The result of his efforts was a system that combines the corporate data base, data bases for each salesperson, and E-mail facilities. The system also automates the exchange of data between sales reps and corporate headquarters. The E-mail system currently connects more than 300 employees, including factory and warehouse workers as well as sales reps and office clerks.

Since the sales force spends most of its time on the road serving customers, Wolverine equipped each representative with an 8086-based laptop from Zenith Data Systems or Toshiba and a portable printer. Each laptop has a 20MB hard disk and a 2400-bps modem. Regional managers have 286-based laptops with 40MB hard disks.

Each rep's laptop contains a data base of information on his or her territory, including credit information, order status, and

WHEN THE MAKER OF HUSH PUPPIES GAVE ITS SALES REPS LAPTOPS FOR THE ROAD, IT IMPROVED CUSTOMER SERVICE, CUT PAPERWORK, AND MADE COMMUNICATIONS EASIER ALL AROUND.

customer inventory position. The managers' data bases include all the data for the reps in their regions.

Because most of the reps have no computer experience, SHINE's user interface was designed to be highly intuitive. For example, a rep can look up credit information on a customer, then press a single key to find the stock number for a shoe that customer wants to order. "It's a very sophisticated system, but it's easy enough to learn that we can train them in a two-day session," Hanson says. Passwords and other connection information are built-in.

LAPTOPS PHONE HOME

Every other day, each sales representative dials into the server located at headquarters. Named Connexion HQ, the server is a 12-MHz 286-based PC with a 40MB hard disk, a multi-serial-port card, and four 9600-bps modems. (The high-speed modems can talk both to the laptops and to 9600-bps modems in the factories.) Connexion HQ acts as an E-mail server and a gateway to the corporate data base on the minicomputer. "The phone transmission is completely automated," Hanson explains. "The connection takes 2 minutes or less per day."

The process that makes the data transfer invisible to sales reps is complex. Any updates to the corporate data base on the minicomputer are exported in ASCII format via a file transfer program and sent to the Connexion HQ server. At the server, a parsing program runs through the changes and routes them to the appropriate salesperson and regional manager. When the salesperson calls in for E-mail, the updates are automatically deposited in a prespecified subdirectory on the laptop. There the local data base (which is written in the Clarion programming language) picks up the data and deposits it in the appro-

Wolverine's system manager, George Hanson, developed the SHINE system, which combines the corporate data base, data bases for each salesperson, and E-mail facilities.

THE BOTTOM LINE

Problem

—Long turnaround time for order fulfillment

—Unnecessary paperwork

—Poor order tracking

Solution

—A laptop for each sales representative

—The SHINE (Shoe Information Network) system, combining electronic mail and data base capabilities with automated connections to the corporate data base

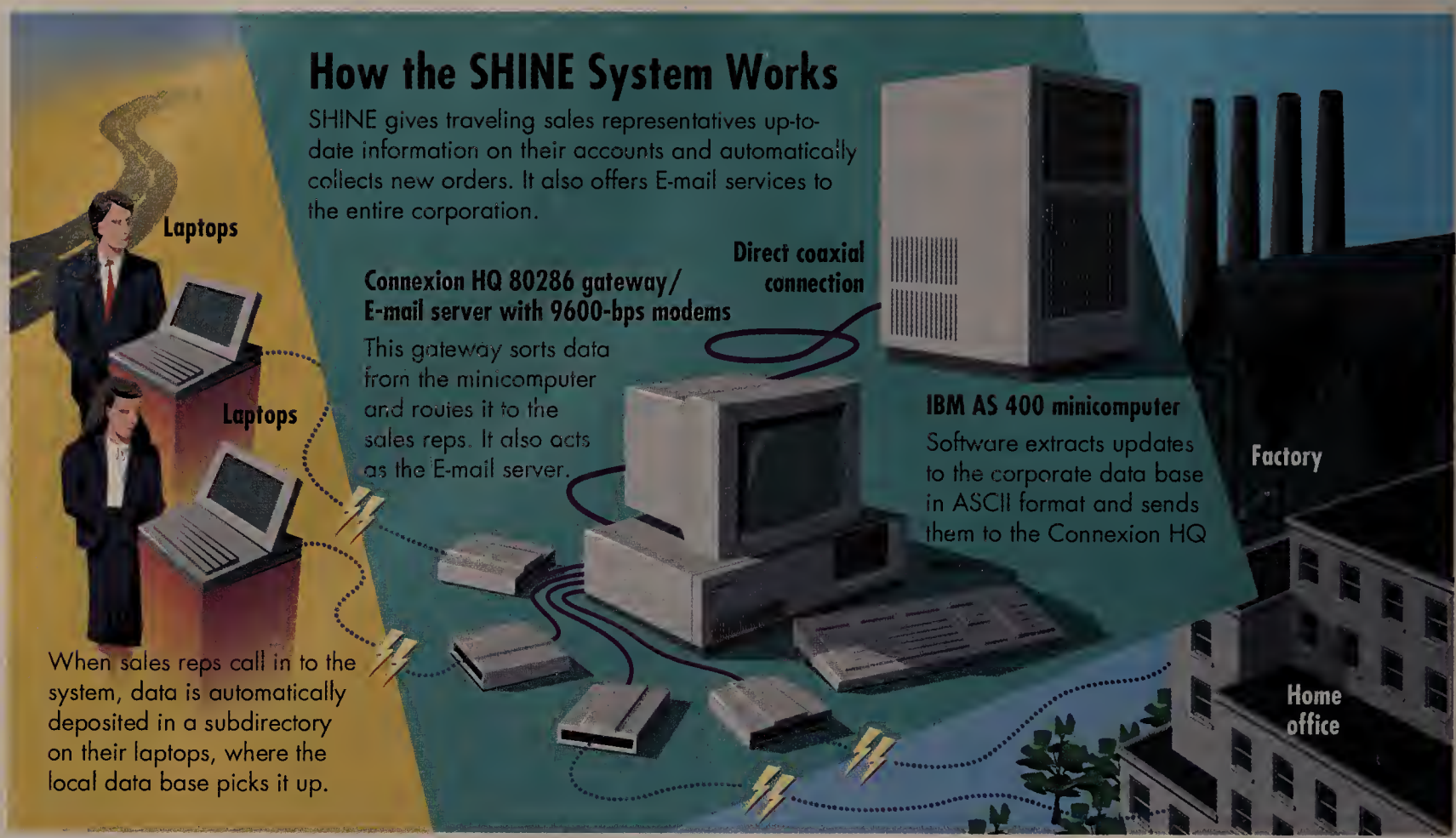
Benefits

—Order fulfillment turnaround time reduced by 90 percent

—Paperwork reduced, particularly for chain store orders

—Improved order tracking and customer service

—Fewer order entry workers required



priate files or fields. The process works in reverse to upload orders to the corporate data base.

All this didn't come cheaply: Hanson estimates hardware costs at $400,000, with software development costs for SHINE at $150,000 to $175,000. On the other hand, Hanson says it would have cost $50,000 per year for E-mail alone, had the company gone with a public E-mail service.

PINPOINTING THE BENEFITS

So what does Wolverine get for its money? While the advantages are difficult to quantify precisely (Hanson estimates that the system is pretty close to breaking even), the sales force has realized a number of benefits from the network.

Most important is the improved turnaround time between taking orders and shipping shoes. Previously, the lag could be as much as ten days; now, if the sales representative places the order before 2 p.m., the order may get shipped that same day.

The salespeople can now also provide a much higher level of service. If a rep calls into headquarters for account information before visiting a customer, he or she can tell the client the status of the order and even warn of delays before they occur.

The reps also save money on phone bills. "One sales rep says he saves $250 per month on phone bills now because he isn't playing phone tag to answer customer questions. He generally has the information right there on his laptop," Hanson says.

Some of the most impressive savings in paperwork involve orders for chains, which often place "program" orders (multiple orders for the same products) for each store. "I have one chain with 35 stores, 6 programs of shoes per store, for a total of 210 orders," says Lizotte. Because of SHINE's "copy" feature, he now fills out 6 orders rather than 210.

Because orders are sent directly to the minicomputer, Wolverine has been able to reduce the office staff responsible for keying in orders from 11 to 4. The remaining staff key in orders that come directly from customers.

UNEXPECTED GAINS

Ease of communication has led to subtle improvements. "Sales reps find it easier to tell the main office about problems. In the past, they might not have done so because it was too much trouble," says Rick Edmondson, a regional manager. And the main office can ask the sales force how well a new pattern or stock number is selling, says Hanson.

Another benefit came when Wolverine provided its salespeople with *PFS:First Choice*, a simple integrated package that includes word processing, spreadsheets, and graphics functions. Many of the salespeople have discovered that they can back up their sales claims with information from the data base. Using *First Choice*, they can present the supporting data to customers in professional-looking documents, complete with charts and graphs.

The sales representatives say that their biggest sales problem now is having to give up their machines for service. "This thing scared me to death when they first put it in," says Marcum. "Now, I don't know how I'd live without it."

Sharon Lynne Fisher is a San Francisco–based freelance writer specializing in computer communications.

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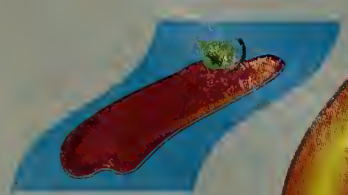

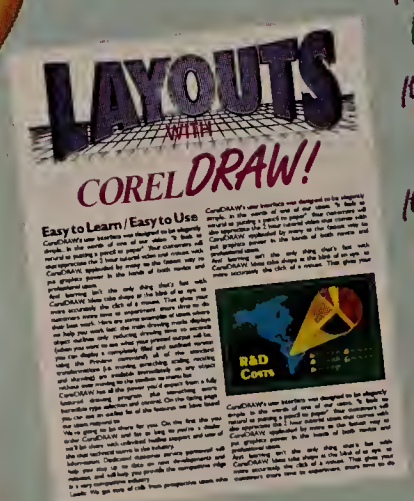

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Upgrades

Whether you're upgrading a floppy-based PC, replacing a crashed hard disk, or swapping a small hard disk for a bigger one, the task of installing a hard disk may someday fall to you. Don't panic—it's a relatively easy task.

Your best bet is to buy what's called a hard disk upgrade kit, containing a drive, a controller card, cables, installation hardware, *and* an instruction manual (which could be worth its weight in gold if you run into problems). Nearly every mail-order PC-and-peripherals house offers these kits, which generally run between $50 and $100 more than the disk alone. We strongly recommend that you purchase one of these kits rather than attempt to match a hard disk and a controller yourself.

For the purposes of this article, we'll assume you're installing a 5¼-inch 120MB hard disk in a conventional AT-type PC running PC-DOS 3.3.

▶ 1. Install the Controller and the Hard Disk

The controller is an expansion board that slides into a slot on the PC motherboard. Use the slot closest to the drive bay. If that slot is occupied, move the board that's there. Remove the old controller card if necessary.

The hard disk slides into a drive bay or cage in your PC (see **FIGURE 1**). Drives come in two sizes, half-height and full-height, so make sure the bay is tall enough for your new drive. (Two vertically stacked half-height bays can hold a full-height drive.)

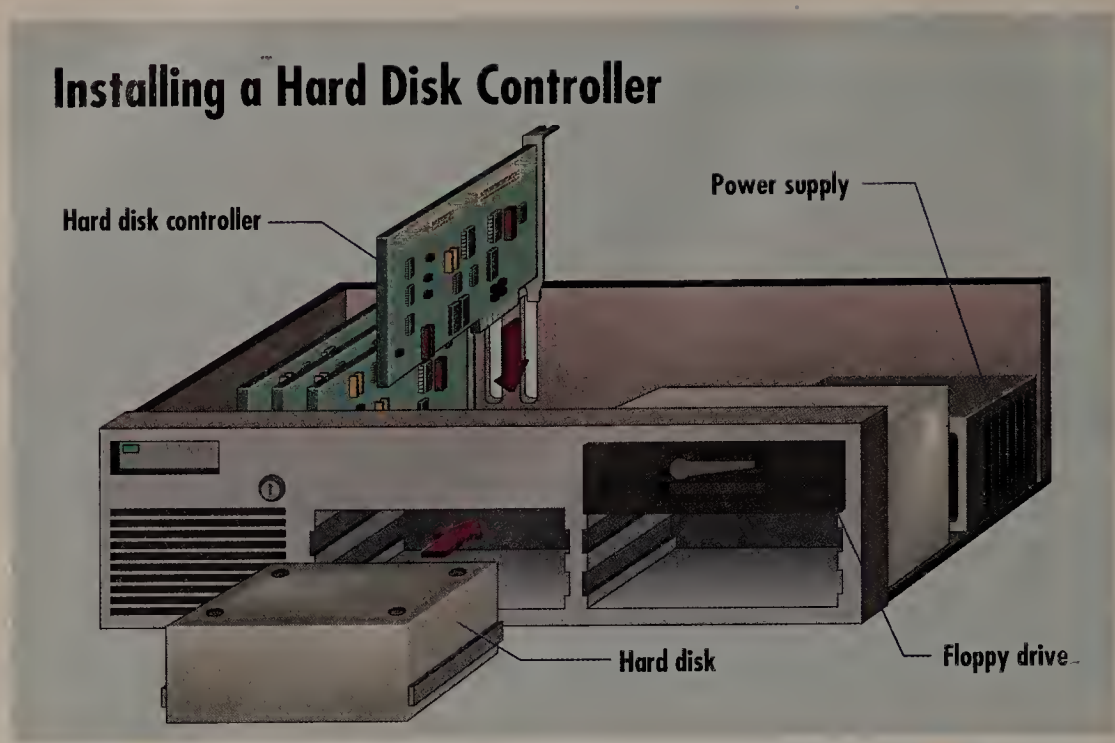

FIGURE 1: Plug the controller card into an open slot, preferably the one closest to the drive bay. The hard disk slides into the drive bay on rails.

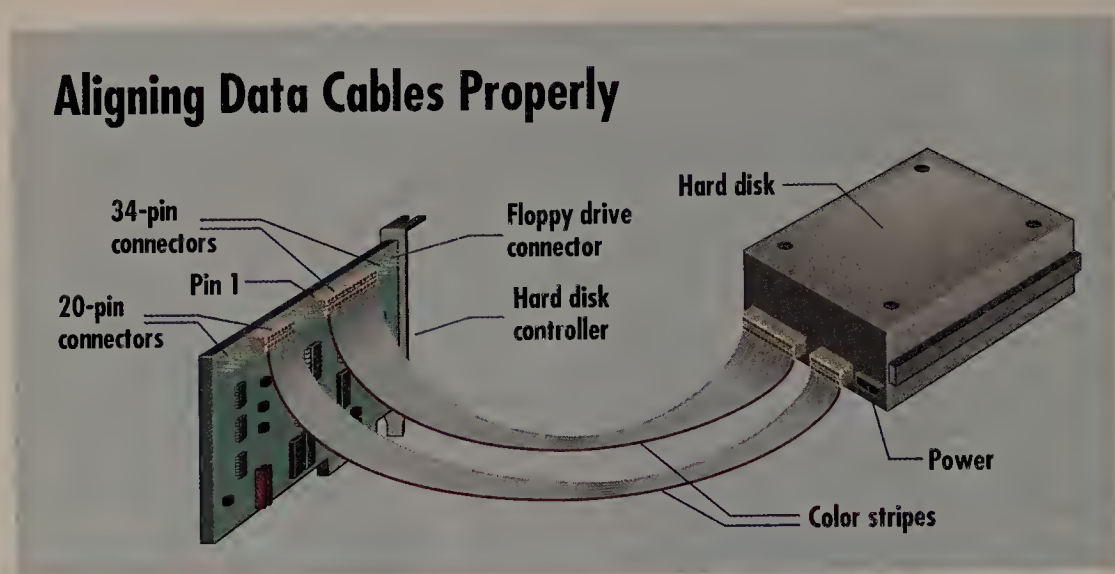

FIGURE 2: Two ribbon cables connect the controller card to the hard disk. Align the color stripe with pin 1 of the connectors. A third cable connects the hard disk to the PC's power supply.

▶ 2. Identify and Connect the Cables

Two flat ribbon cables connect the hard disk to the controller card. The cables are different sizes, and it's impossible to confuse them. However, with four connectors on the controller, hooking the cables to it can be confusing.

The 34-pin connector closest to the back of the board is for a floppy drive cable (see **FIGURE 2**). You'll use the second 34-pin connector and the 20-pin connector next to it for the hard disk.

Ribbon cables have a red or black stripe along one edge, identifying pin 1 of the cable plug. Locate pin 1 on the controller board's 34-pin connector (it should be closest to the front of the PC and will probably be marked "1"). Place the 34-pin cable connector so the stripe aligns with pin 1; press it into place. Repeat for the 20-pin cable.

Now connect the ribbon cables to the edge connectors of the hard drive. Most drive connectors have a locating key that prevents you from plugging the cables in backward. If your connectors don't have a key, use the color stripe to line up the plug with pin 1 of the hard disk's connectors.

Some 34-pin data cables have three plugs: one that mates with the controller card and two that match the edge connector on the hard disk. The middle plug is used only when two hard disks in the system are running off the same controller card. Since our controller is serving only one drive, ignore the middle plug and use only the two end plugs.

Now you need to connect the power cable, a four-wire affair ending in a white plastic plug. Look for a spare power cable coming from the PC's power supply or motherboard and plug it into the 4-pin power connector at the rear of the hard disk. This connector is shaped so the cable goes in only the right way.

Most hard drives have a jumper that tells the controller whether it's the first or second drive. Refer to the drive's installation manual, and set the jumper in the first-drive position. If you don't have that information, assume it's set correctly; however, if the drive doesn't work, your first call should be to the vendor to double-check the jumper position.

If you removed an old disk controller card for this upgrade, you'll need to reattach the ribbon cable for your floppy drive to the rear 34-pin connector on the new controller, as noted in **FIGURE 2.**

▶ 3. Update the Drive-Type Table

Now you must tell your PC what type of drive you've just installed. Most PCs use a standard set of drive types, and most drives come with a drive-type number stamped on the case. For example, Seagate's popular 20MB drive is usually type 2.

Since this is the only hard drive in the system, it will be drive C: (or fixed disk 1). All you have to do is run the PC's setup routine, type in the new drive-type number, save the configuration, and reboot the PC. Depending on the PC, the setup routine may be initiated from the keyboard—usually by pressing **<Ctrl>-<Alt>-<Esc>** or **<Ctrl>-<Alt>-<Enter>**—or by running a software program that came with your PC. Check your user manual for details.

If you can't find the drive-type num-

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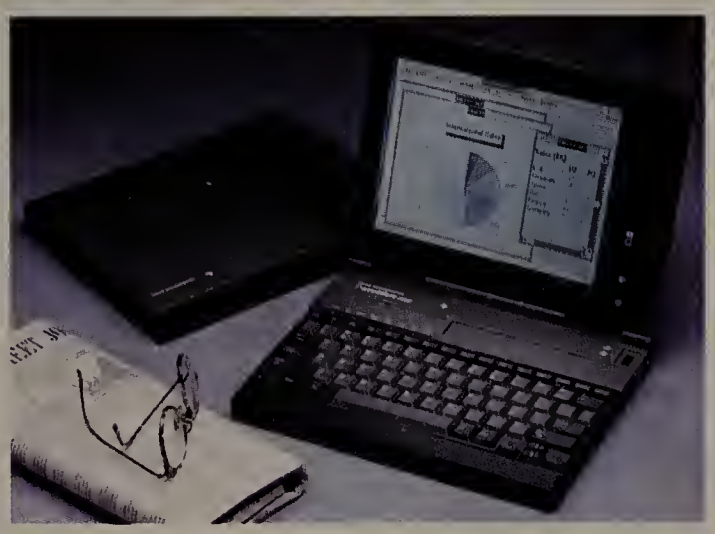

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ber, your setup routine may provide a list of drives identified by manufacturer and model, which you can select from. In a worst-case scenario, some setup programs let you enter cylinder, head, sector, and precompression parameters into a generic-drive table. These parameters are usually in the hard disk owner's manual or stamped on the case.

If you can't identify the drive type or don't see it in your PC's drive-type table, contact your dealer or the drive manufacturer. *Do not guess* at the drive type or choose randomly from the drive-type table. You probably won't do any permanent harm, but some wrong settings can damage a hard disk.

Low-Level Formatting

Most hard disks come low-level formatted from the factory. Low-level formatting creates the read/write tracks on the blank magnetic surface of the disk.

Unfortunately, high temperatures, impact during shipping, or the like may result in your disk arriving *sans* a low-level format. If you run FDISK and get a 'No fixed disks present' error message, there's a chance that the low-level format is missing.

Often the utility disk that comes with the hard disk (or the PC) contains a low-level formatting program. Several inexpensive commercial programs like *SpeedStor* do low-level formatting too. —*TJB*

▶ 4. Partition the Hard Disk

Now you need to create a primary DOS partition on the hard disk. Remember, we're using DOS 3.3; there are slight differences with other DOS versions.

Reboot the PC with the DOS floppy in the A: drive. When you see the DOS prompt, type **fdisk** and press <**Enter**>. From the first menu, choose option 1, Create DOS Partition. A new menu will appear. Once again, select option 1, Create Primary DOS Partition. When asked if you wish to use the maximum size for a DOS partition and make it active, choose Y. Finally, press any key to restart the system.

You have now created a primary DOS partition of 32MB, the largest you can create with DOS 3.3, which both you and your system will recognize as drive C:. Drives referred to by letter are logical drives, as opposed to the physical

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hardware itself. One physical drive can consist of many logical drives.

▶ 5. Creating Additional Logical Drives

To create three or more new logical drives, start FDISK, choose option 1, Create DOS Partition, and then choose option 2, Create Extended DOS Partition. The screen now shows how much of the disk has been used by the first partition and how much is available. Press <**Enter**> to use it all.

Now press <**Esc**>, and enter the number of cylinders for the next logical drive. You may create as many logical drives as you wish—at least until you run out of alphabet letters or disk space.

A logical drive's size is determined by the number of cylinders you assign to it. In our example, a total of 614 cylinders account for 120MB of disk space, making each cylinder worth 195K; 164 cylinders equal 32MB. The number of kilobytes per cylinder varies depending on the disk design. Fortunately, FDISK's readout shows the total number of cylinders, so if you know how many megabytes your hard disk holds, you can figure out how many cylinders to use for each logical drive.

Before you leave FDISK, make sure drive C: is the active partition—otherwise you can't boot from it, even after it's properly formatted.

▶ 6. Formatting the Drives

Before you can use the partitions, you need to format them with the FORMAT command found on your DOS floppy. If you use the /S switch, as explained below, it will install the operating system too, so you'll be able to start the computer from the hard disk.

Since this is the only hard disk in the PC, enter **format c: /s** at the DOS prompt, and press <**Enter**>. (Be careful! If the new drive is the second hard disk, this command will destroy all the data on your C: drive.)

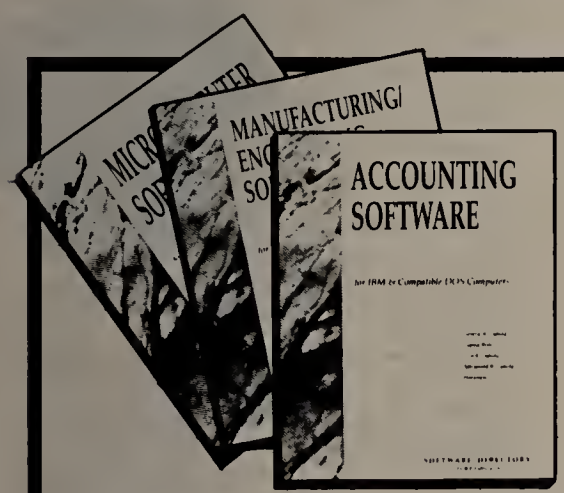
Ignore the warning message, and proceed with formatting by entering **y** and pressing <**Enter**>. Repeat this procedure for each logical drive, substituting the appropriate drive letter and eliminating the /S switch (since you need to install the operating system only on the booting hard drive, C:). For example, **format d:** <**Enter**>.

▶ 7. Modify the CONFIG.SYS File

Finally, use a text editor in ASCII format (or use DOS's EDLIN command), and add the following line to your CONFIG.SYS file: **lastdrive** $=x$ (where x is the letter of the last logical drive in your machine). Example: LASTDRIVE = F.

And that's it! More power to you.

TJ Byers is a contributing editor for PC World.



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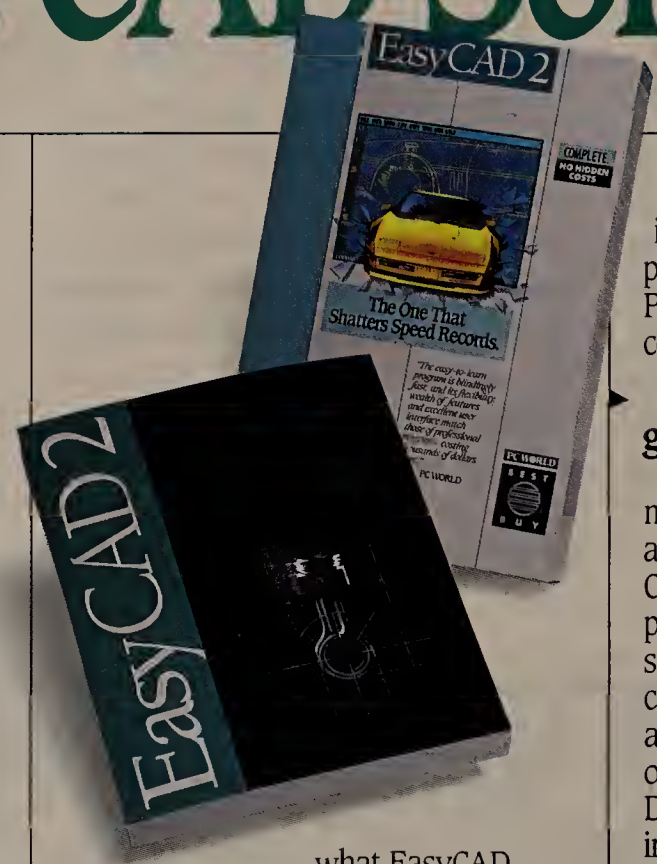

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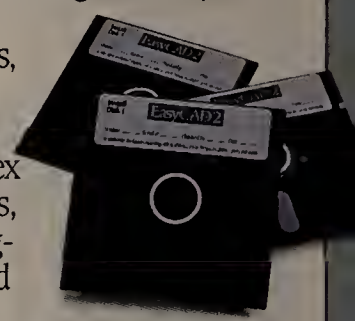

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Words Into Print

Word Processing

Tips for getting the most out of your word processor

This month: Get organized with your word processor's outlining features, master WordPerfect indentation, and control Word's hidden text display.

George Campbell

Effective writing starts with organized thinking. You can block out a letter or memo in your head, but anything longer generally needs more planning. The traditional topic outline, like the framework for a building, is hard to beat as an organizational tool. Creating an outline before you start can save you the pain of extensive rewriting later. Once the outline is finished, you can concentrate on expressing yourself clearly, using the topics in the outline to stimulate your thinking.

Most word processors, like *WordPerfect*, have simple outliners that are essentially numbering schemes. This type of outliner lets you move elements around without having to renumber the headings and all the subheadings below. Once the outline is finished, however, you'll probably need to open a new file for the text and refer to a printout or an on-screen version of the outline when necessary. If your word processor lacks the ability to expand and contract outlines, including actual text in them is more difficult.

Word and *Word for Windows* offer more outlining power, letting you build your document directly upon the outline. You can expand and contract *Word* documents to show all or part of the text or just the outline. To reorganize a document, you simply contract it, move the headings around, then expand the document again. Since selecting a heading selects all related text, you can edit and reorganize complex documents without extensive scrolling and searching. *Word* can even create a table of contents from outline headings.

If your word processor lacks an outliner, or if you want more outlining power, you can buy a stand-alone outliner such as *GrandView* or *PC Outline*. These provide even more outlining tricks than *Word*.

Outlining Strategies

Here are some basic steps for creating outlines. *WordPerfect 4.0* and *5.0* keystrokes are used as examples, but the procedure is similar in most other word processing programs.

First, select a numbering format. The standard format (I. A. 1. a.) is usually fine, but lawyers and engineers may prefer legal or technical numbering (1 1.1 1.1.1). To choose a different numbering style in *WordPerfect*, press **<Shift>-<F5>d**, then select a style from the menu or create your own.

Next, turn on your program's outlin-

WORD SHORTCUT

Hiding Word's Hidden Text

If you want to insert nonprinting text in *Word 4.0* and *5.0* for notes or comments, hidden text is a perfect solution. To hide text, select the text, then press **<Alt>-E**. (To return the text to normal, select it and press **<Alt>-<Space>**.)

To make hidden text display on the screen or disappear with one keystroke, create this *Word* macro. Follow these steps on a blank *Word* screen:

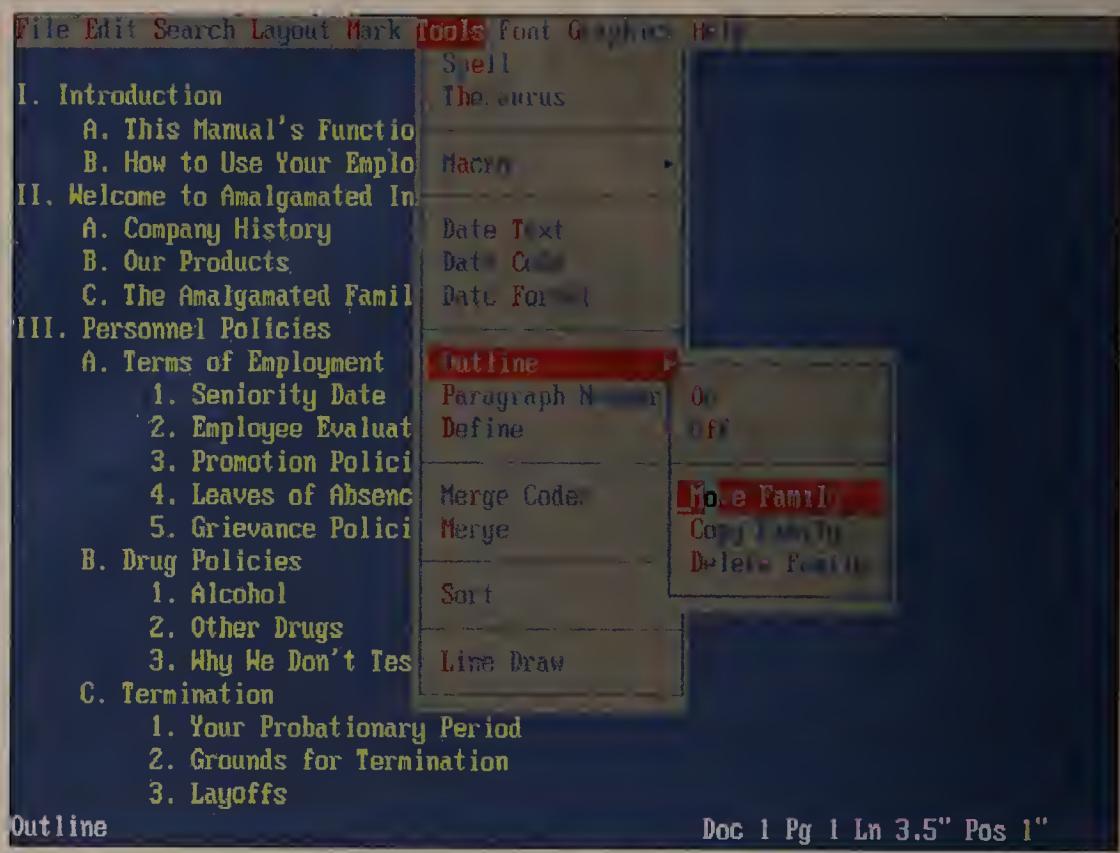
1. Press **<Shift>-<F3>** to start recording.
2. Press **<Esc>o<Cursor Right><Space><Enter>**.
3. Press **<Shift>-<F3>** to end recording.
4. Type **Hide.mac^**, press an unused <Ctrl>-*key* combination like <Ctrl>-H, then press **<Enter>**.

To display or hide hidden text in any document, you can simply press the <Ctrl>-*key* combination. To hide or redisplay the hidden text markers that remain, press **<Esc>o<Cursor Right><Cursor Down>**, then press **n** to hide the markers or **a** to display them, and press **<Enter>**.
—*G. C.*

ing mode. In *WordPerfect*, press <Shift>-<F5>oo<Enter>. Now you're ready to enter the first major topic. The typical outline uses chapter titles as first-level entries, with section headings as the second level. Next, you can add subsections and individual paragraphs, as well as other levels for more detail. *WordPerfect* supports eight indentation levels, but four is enough for most purposes.

After typing the first entry, press <Enter>, then issue the command to indent one level. (In *WordPerfect*, press <Tab>.) Type the next entry, and press <Enter>. *WordPerfect* stays at the current level unless you tab to a lower level or move to a higher one by pressing <Shift>-<Tab>.

WordPerfect also allows you to include text other than headings. To do this, backspace over the number that *WordPerfect* proposes, then type the text. Most programs let you change an entry's ranking in the hierarchy. In *WordPerfect*, move to the beginning of an entry, then press either <Tab> to demote the entry or <Shift>-<Tab> to promote it.



WordPerfect 5.1's Tools menus let you control all aspects of an outline's structure. When you move a heading, you can move the subheadings with it.

You can also move, copy, or delete entries in the outline. In most word processors, selecting a heading also selects all subheadings and normal text you've included. To move an entry in *WordPerfect*, press <Shift>-<F5>om, move the selection with the cursor keys, then press <Enter>. To copy an entry, press <Shift>-<F5>oc, move the block, and press <Enter>. To delete an entry, press <Shift>-<F5>od, then press y to confirm. *WordPerfect* will automatically renumber all of the entries.

Once the outline is finished, use it to help shape your document. Working from a printed copy of the outline is fine, but if your program can display multiple documents, you may prefer to work with it on line. In *WordPerfect*, press <Shift>-<F3>, retrieve the outline file, then press <Shift>-<F3> again and load the main document. Then, whenever you want to switch between the outline and the document, simply press <Shift>-<F3>.

Refer to the outline often to avoid drifting from the plan. And if you add new topics, be sure to keep the outline up-to-date.

George Campbell is a contributing editor for PC World.

WORDPERFECT SHORTCUT

Perfect Indents

WordPerfect 5.0 and *5.1* offer four keystrokes for indenting paragraphs in different ways. You can use them on existing text or before typing.

- To indent just the first line of a paragraph, use the <Tab> key. The rest of the lines will align with the left margin.
- To indent an entire paragraph, press <F4>. All text will move right to the next tab setting. For a wider indentation, repeat the command.
- To indent both sides of a paragraph, as for a long quoted passage in a document, press <Shift>-<F4>. If you want to produce even narrower blocks, repeat the keystroke.
- For a hanging indent (first line flush left, following lines indented), first type the paragraph, then move to the first character of the paragraph and press <Shift>-<F4>, then <Shift>-<Tab>.

Each of these keystrokes indents to the next tab stop. To alter tab positions, press <Shift>-<F8>lt. To remove any of these indents, move the cursor to the first character of the paragraph and press <Backspace>. —*G. C.*

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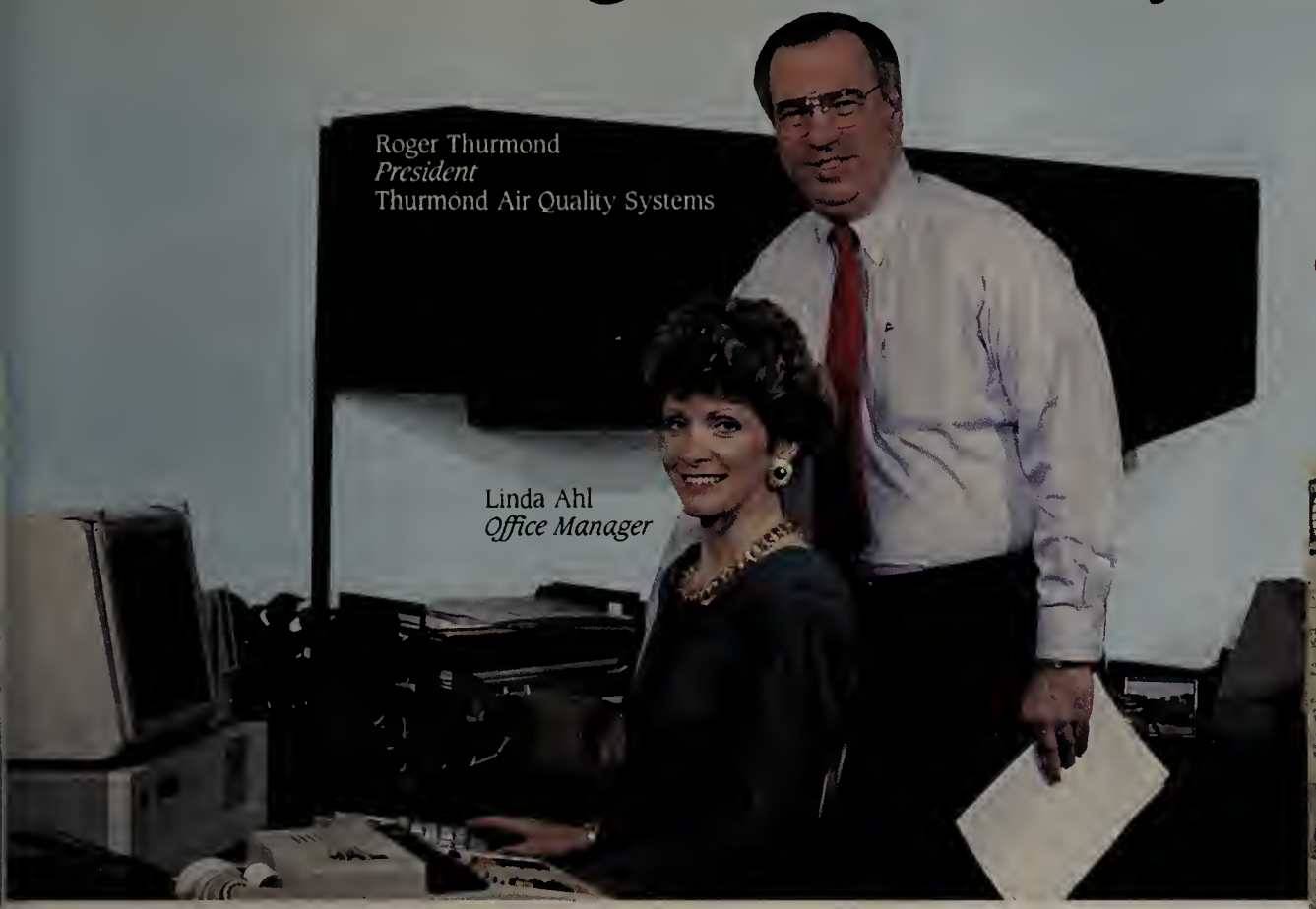

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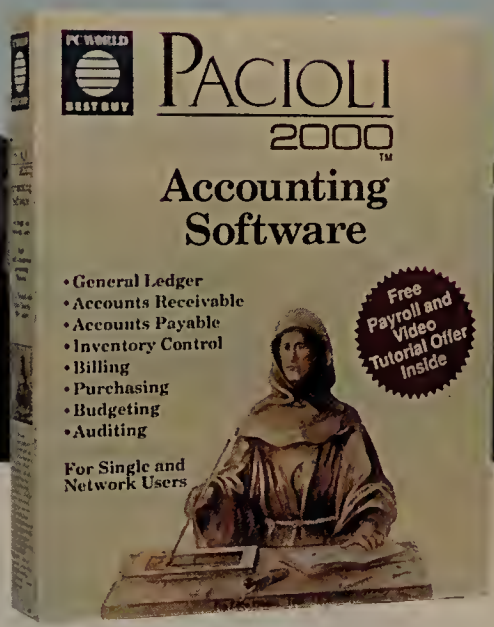

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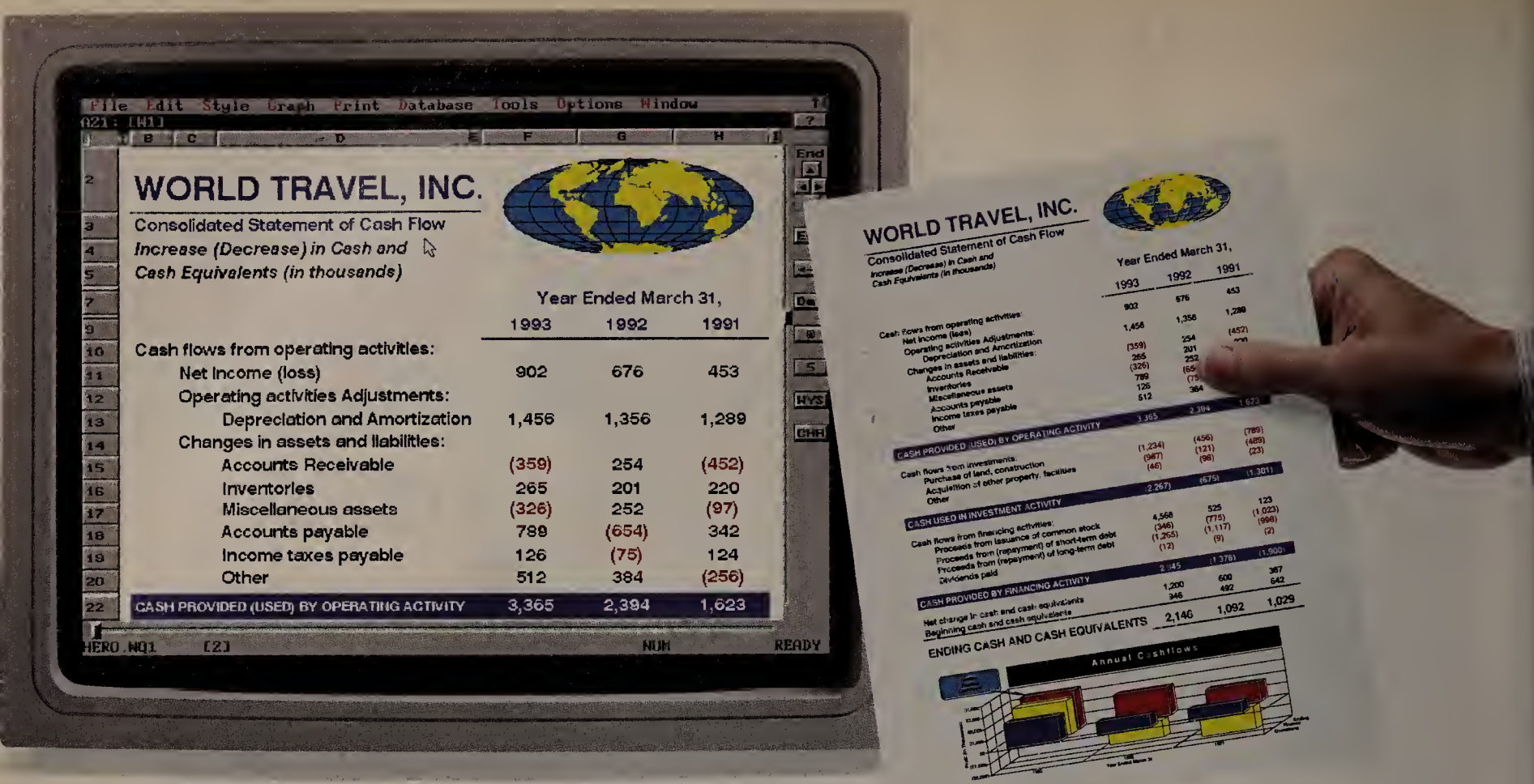

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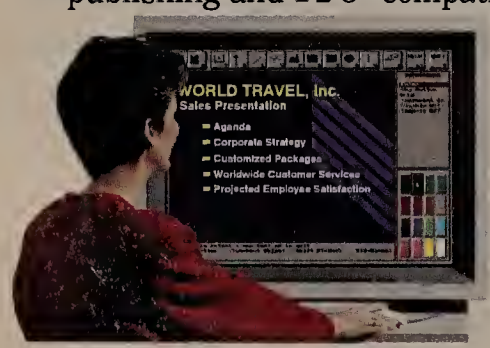

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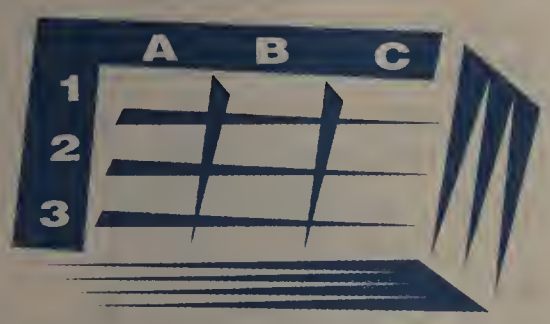
Spreadsheets (A..Z)



Spreadsheets

Practical tips for building better worksheets

This month: the missing link

Richard Scoville

The data values you enter into a worksheet often originate in another spreadsheet file. Instead of making you rekey them, *1-2-3* release 2.2 lets you create a linked formula that draws data directly from a cell in an unopened file on your disk. In this month's column we'll build the simple checkbook register shown in **FIGURE 1** to demonstrate linked formulas and other template techniques.

Daisy Chains and Consolidations

Linked formulas find application in two general situations: consolidations of several worksheets into a single summary worksheet and "daisy-chain" templates. A daisy chain is a series of templates in which the closing value(s) of one file becomes the opening value(s) for the next, as in our checkbook register example.

Building the Model

To build this month's template, begin in column A and set the width to 5 spaces: Select */Worksheet Column Set-Width,* type **5**, and press <**Enter**>. Similarly, set column B to 7, C to 28, and columns D, E, and F to 10 spaces. To display numbers with commas and decimals, use */Worksheet Global Format* followed by a comma, type **2**, and press <**Enter**>. Then, enter the labels shown in A1..F4 of **FIGURE 1**. To enter the double line shown in row 14, enter \= in cell A14, select */Copy,* press <**Enter**> followed by a period, use <**Cursor Right**> to highlight cells A14..F14, and press <**Enter**>.

In cell F5, enter the formula **+E5** for the opening balance. In F6, enter **+F5-D6+E6** to calculate the next balance, then copy that formula down the column: Select */Copy,* press <**Enter**> followed by a period, use <**Cursor Down**> to highlight the range F6..F13, and press <**Enter**>. In cell F3, enter the following formula so that the closing balance shows at the top of the register: **@index(f5..f14,0,@count(c5..c14)-2)**. (This formula treats the balances in F5..F14 as a one-column table. The @INDEX function gets the final balance from the table's leftmost column (0). @COUNT() calculates the row number for @INDEX from the number of items in the register calculated from the number of entries in the description column.) To identify the closing balance with a range name, move to F3, select */Range Name Create,* type **balance**, and press <**Enter**> twice.

Finally, enter the check register data into A5..E13. Since the check numbers and dates are labels composed of digits, prefix each one with an apostrophe. To

Linking Worksheets by Formula

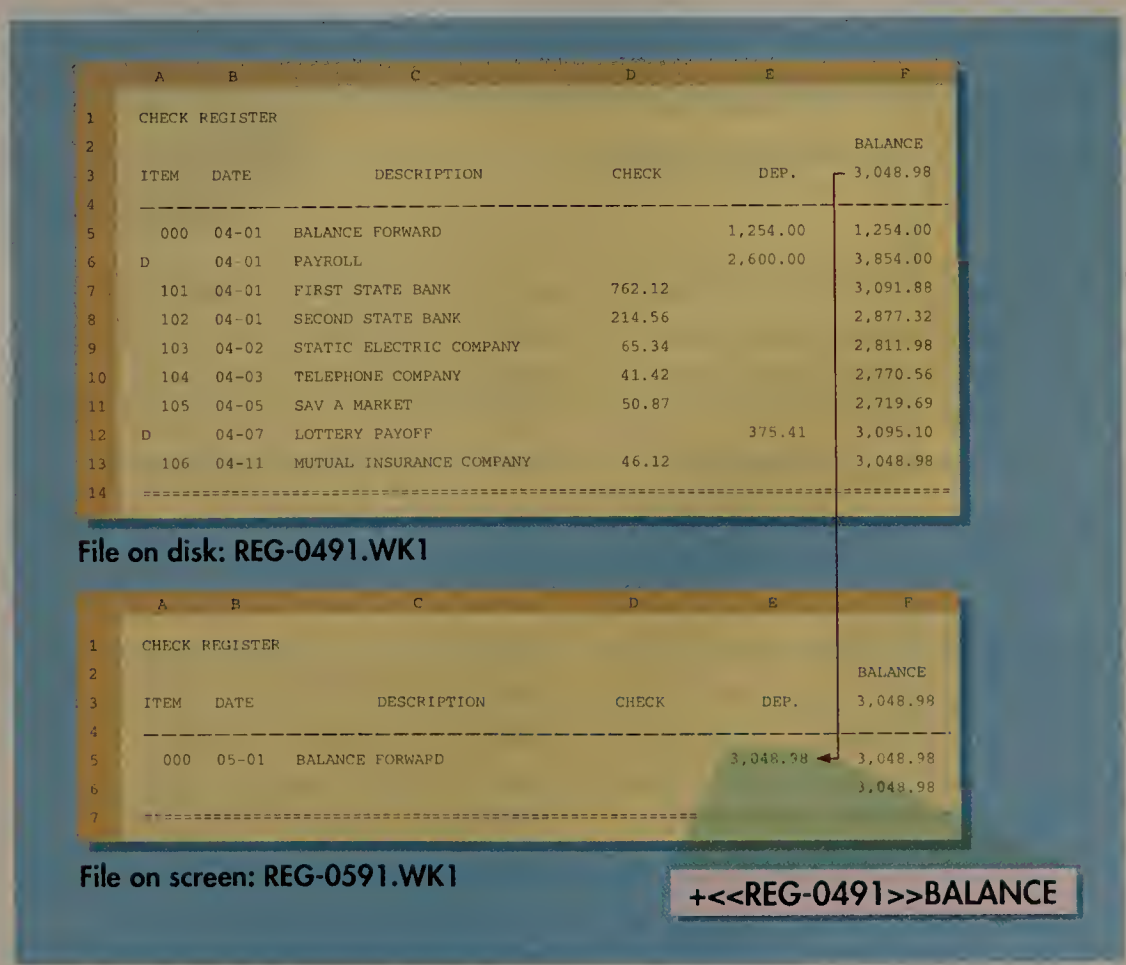


FIGURE 1: The highlighted formula in the sample worksheet (bottom) carries forward the balance of an unopened worksheet (top) by addressing first its file name, REG-0491, then the appropriate cell name, BALANCE.

SPREADSHEET TOOLBOX

Look Before You Link With Look&Link

If you're a *1-2-3 2.*x user whose template applications are beginning to span multiple files, you've probably been frustrated at not being able to *see* the file you're trying to link to. *Look&Link*, a $99.95 add-in from Personics Corporation, lets you pop up a window on your worksheet and display a disk-resident spreadsheet in it. You can travel freely around the pop-up worksheet; function keys <F5> and <F3> let you review and move to named ranges.

Once you've found what you're looking for, you can easily copy it to the current worksheet à la *1-2-3*'s File Combine command or create a linked formula. By swapping the screen- and disk-resident files, you can even duck into the other file to make changes. And if you're still using release 2.01, the *Link* part of *Look&Link* will let you create linked formulas without upgrading to the new release. In short, *Look&Link* is a specialized, uniquely useful addition to your tool kit. —*Richard Scoville*

Look&Link $99.95; Personics Corp., 63 Great Rd., Maynard, MA 01754; 800/445-3311, 508/897-1947 (fax)
Reader service no. 612

EXCEL SHORTCUT

Sorting Your Data by Columns

Ralph Soucie

Though most *Excel* worksheets contain records arranged by rows, you may need to arrange data by columns—if your data is organized like the Features Evaluation table in a *PC World* review, for example. Let's say you have a worksheet containing a list of ratings for each of several candidates for a job. The candidates' names are displayed in the first row of the worksheet in columns B through H, and the ratings are shown in rows 2 through 10 in the columns below each name.

To sort the list, use the mouse, or hold down <**Shift**> and use the cursor keys, to select all the cells that contain data—B1 through H10 in this case. Don't select cells containing titles or other labeling information. Choose *Data Sort* and select *Columns* in the Sort By box. In the 1st Key box, replace the row number in B1 with the row address you want to sort by (row 1 contains names; rows 2 through 10, ratings). Choose *Ascending* for alphabetical sorts or *Descending* for highest to lowest ratings. Press <**Enter**> to carry out the command.

make room for more items, put the cell pointer on row 14 and add rows with */Worksheet Insert Row*. The closing balance formula expands to accommodate the new rows. Each time you enter a new item, copy the previous balance formula into the new row to keep the balance current. You may want to build a macro to insert the rows and copy the formula.

The Linked Formula

Save the completed worksheet with a file name that identifies it as the check register for April 1991: Select */File Save*, type **reg-0491**, and press <**Enter**>.

May's register will take its opening balance from April's closing balance with a linked formula. First, clean out the data values from April's file: Put the cell pointer on A7, select */Worksheet Delete Row*, highlight A7..A13, and press <**Enter**>. Then select */Range Erase*, highlight A6..E6, and press <**Enter**>. Move to cell E5 and enter the linking formula **+<<reg-0491>>balance** (REG-0491 is the name of the source worksheet file). Now you're ready to enter data for the new month, inserting rows and copying the balance formula for additional items as described above.

In release 2.2, a linked formula may consist of a single cell reference only: You cannot include any calculations within the linked formula, and your formulas may not refer to a multicell range in the other file. As we've done in our example, be sure that you always assign a range name to the cell that will be referenced by a linked formula; range names are easier to remember than cell addresses, and if you move the referenced cell to a new address, the range name will still find the correct value. Each time you retrieve a file containing a linked formula, *1-2-3* returns to the source file and rechecks the value of the referenced cell. And that means less cross-checking for you.

Richard Scoville and Ralph Soucie are contributing editors for PC World.

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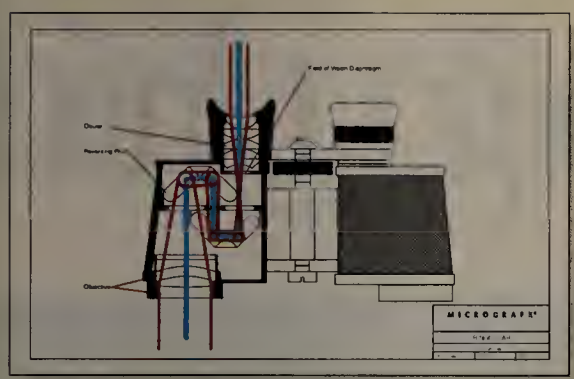

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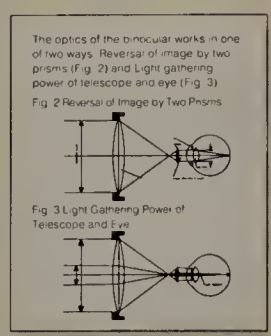

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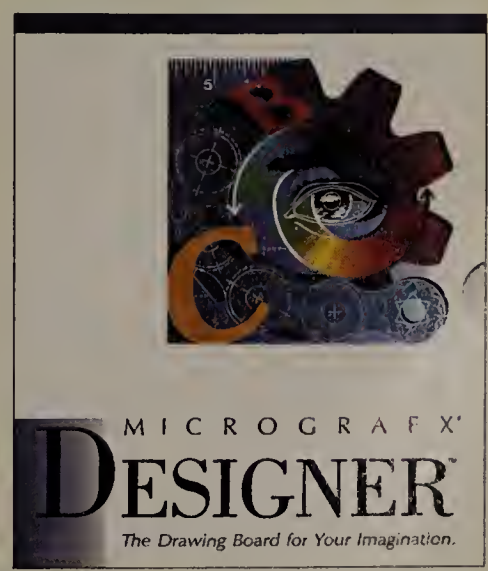

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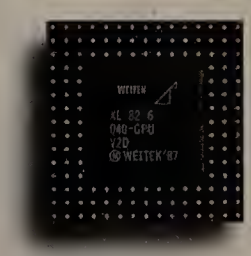

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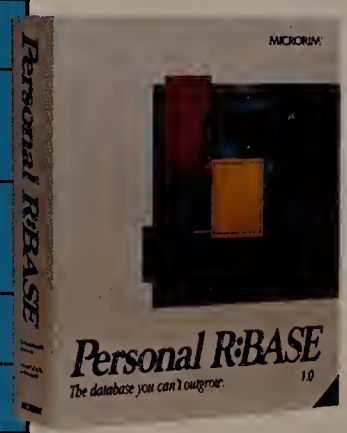

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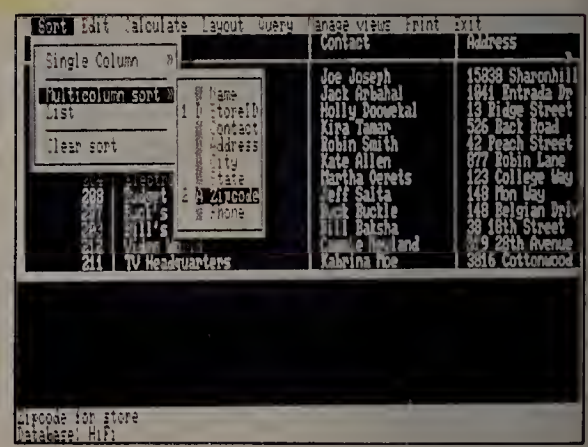

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Data Basics

Data Management

Tips and techniques for managing your data

This month: Getting data from relations

Steve Cummings

Whether you know it or not, you probably use a relational data base. Your company's data management system is likely to be relational because, for all but the simplest data-handling needs, nothing else is practical. Most people within an organization needn't know how their data is structured; when they print an invoice, they don't care that the customer's name comes from one data table and the products ordered from another. But if you're planning your company's or department's future, you want to be able to query data creatively, and that requires knowing how your data is organized.

A relational data base is one that can link data from two or more tables via a common field or fields. (A *table* is a simple data structure—usually a single file—with records and fields much like the rows and columns of a spreadsheet.) For example, if the customer and invoice tables share a Customer ID field, you can easily find an invoice's customer or a customer's invoices.

Multitable Invoicing

Why use a relational data base? Consider a basic invoicing system. At a minimum, you need information on customers, inventory, and sales. Stuffing all of this data into a single table would be a nightmare of redundancy and potential error.

Suppose each record in the table corresponds to a different invoice. Every time customer Jones buys a Gizmo, you'd have to reenter Jones's full name and address and the Gizmo's unit price. When you delete a new customer's order, you lose all record of that person. And what happens when customer Jones buys a Gizmo, a Whatsit, and a Flopnik? A single table always limits the number of line items (products being sold) you can include in a single order.

Now consider a four-table relational system (see **FIGURE 1**). You still have an invoice table with a record for each order, but that table now needs only three fields: invoice number, customer ID, and transaction date (you can also include shipping and payment information). When you print an invoice, your data base takes the name and address from the customer table, the products ordered from the line item table, and the product descriptions from the inventory

PARADOX SHORTCUT

Preparing an Embedded Form

Celeste Robinson

Before you can create a relational invoice form in *Paradox 3.0* or a later version, you have to make a multirecord line item form to embed in it. Start by using *Form Design* to create a form in your line item table.

Place the fields and their prompts in the upperleft corner of the form design screen. Use *Field Place Regular Prod ID* repeatedly to place all of the table's fields, except Invoice no., next to each other on line 2, starting at the beginning of the line. Once the fields are placed, type labels in the first line, directly above the fields.

You're now ready to turn this into a multifield form for entering, editing, and viewing multiple line items. Press <**F10**>, and select *Multi Records Define.* Move the cursor to the beginning of the second line (where the line of fields begins under the prompts), press <**Enter**>, move the cursor to the end of the last field, press <**Enter**> again, move the cursor down five lines, and press <**Enter**> yet again. Then save the form with a *DO-IT!*

When you create the invoice form, use *Multi Table Place Linked* to insert your multiline line item form. Any line items entered in this form will be relationally attached to the correct invoice.

Relating to Your Invoice

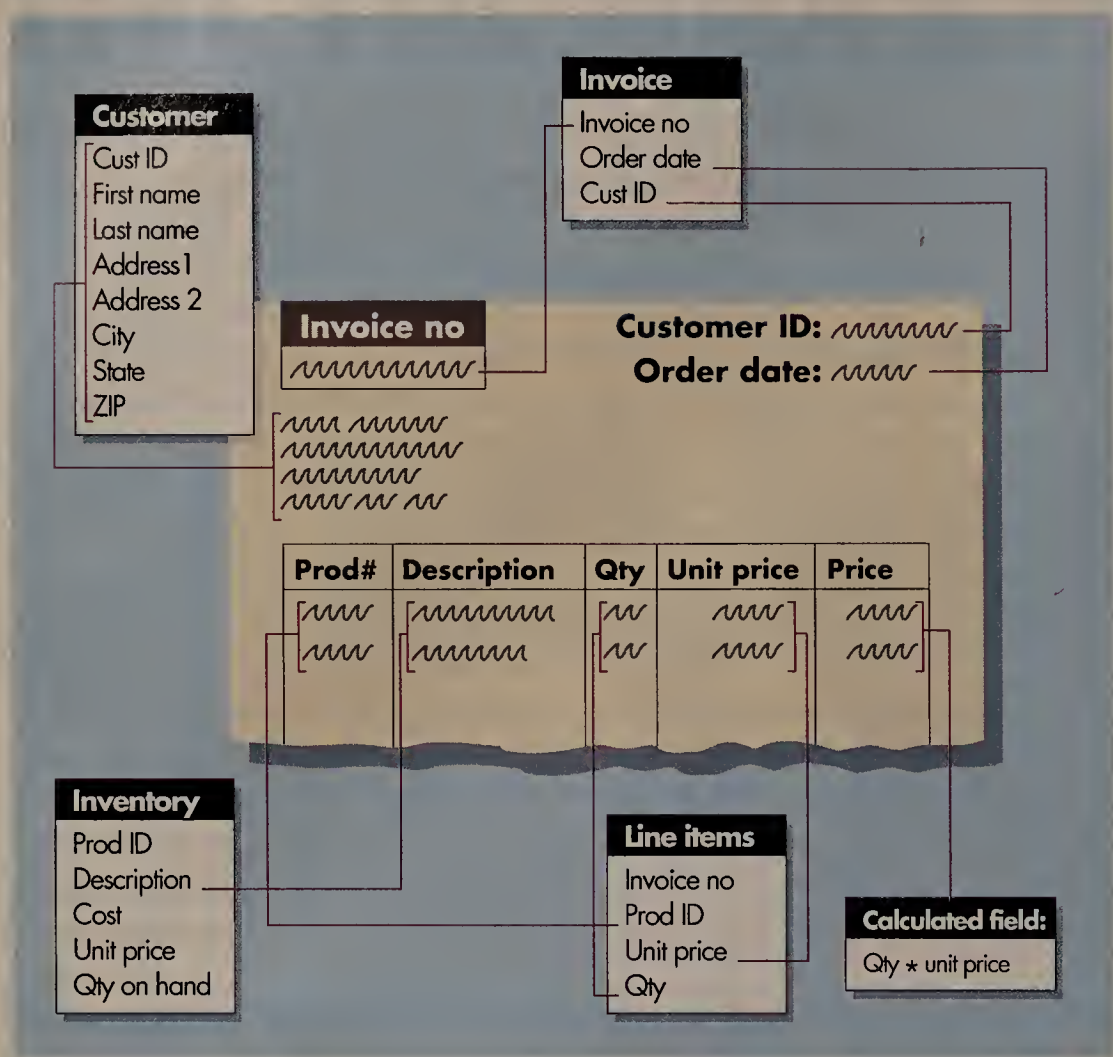

FIGURE 1: By keeping your data in four separate but linked tables, you can create an invoicing system that's more powerful, more flexible, and easier to use.

table. This system lets you keep customer and product information in their proper places, and attach any number of line items to an invoice in what is called a one-to-many relationship.

Getting Versatile

You don't need to know the data structure to print an invoice, but with such knowledge you can print queries and reports that the data base designer never thought of. Suppose you want to see your dollar sales, by state, for a given business quarter. A relational system makes this easy.

Since you'll be sorting your query by state, start with the table that stores your customers' addresses—the customer table. In relational jargon, this is now the *parent* table, the one that other tables (children) will relate to. To access the product sales information in the line item table, you first link the invoice table to the customer table by the customer ID field, then link the line item table to the invoice table via the invoice number.

With these links established, use your data manager's query tool or report writer to select invoices recorded during the business quarter in question. You can then display or print each state name along with a subtotal (unit price times quantity) for the line items related to that state.

That's only the beginning. From the same tables, you could see which products are your best-sellers, tell whether volume sales bring more revenue than single-item sales, and—with one additional field in the invoice table—identify your best salespeople. You can use a relational data base without knowing how it's structured, but you'll get much more out of it if you do.

Steve Cummings is the author of Understanding Quicken *(Sybex, Alameda, California, 1990). Celeste Robinson is the author of* The Best Book of Paradox *(Howard W. Sams and Co., Carmel, Indiana, 1990). Lincoln Spector is an assistant editor for* PC World.

dBASE SHORTCUT

View From a File

Lincoln Spector

Relating two *dBASE* files is a multistep process. You first open the files in different work areas, making sure that the child file is indexed on the relationship's key field (the field the two files have in common). You then set the relationship. The command syntax looks something like this:

```
USE Customer INDEX C—custno
SELECT 2
USE Invoice INDEX Invno
SET RELATION TO custno INTO;
Customer
```

Thanks to dBASE VUE (view) files, you needn't go through this routine more than once. To create a VUE, type **CREATE VIEW** *filename.* This brings you to a menu-driven view-creation screen. Because you've already created a relation, all you need do is select *Exit Save.* From then on, recreating your relation is a simple matter of typing **SET VIEW TO** *filename.*

CREATE VIEW can do a lot more than this. For example, you can use it to set filters and to pick which fields from the two data files will be displayed.

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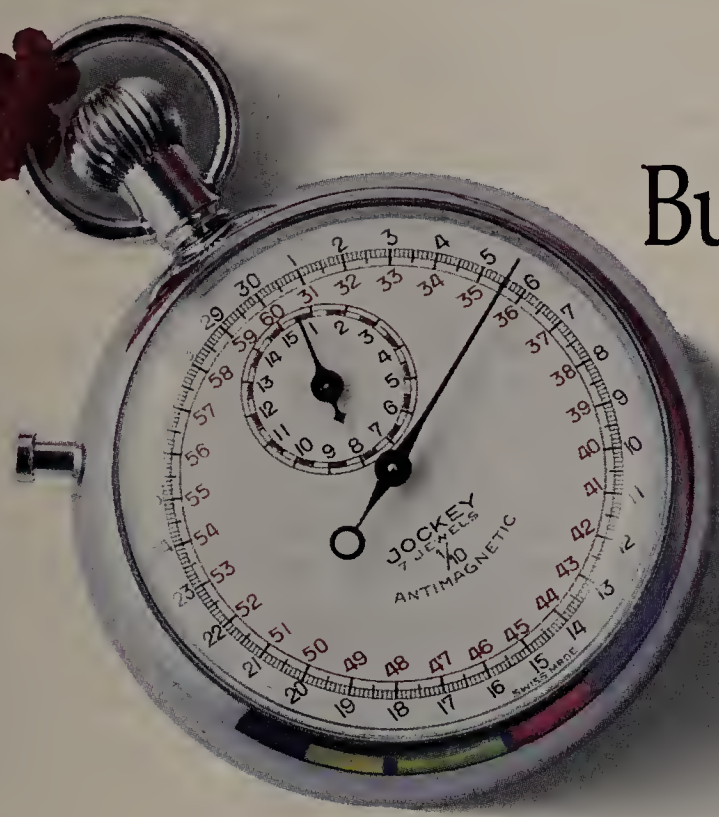

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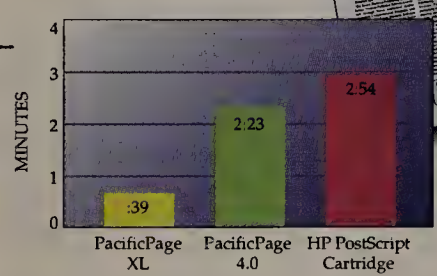

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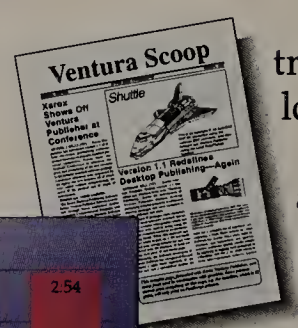

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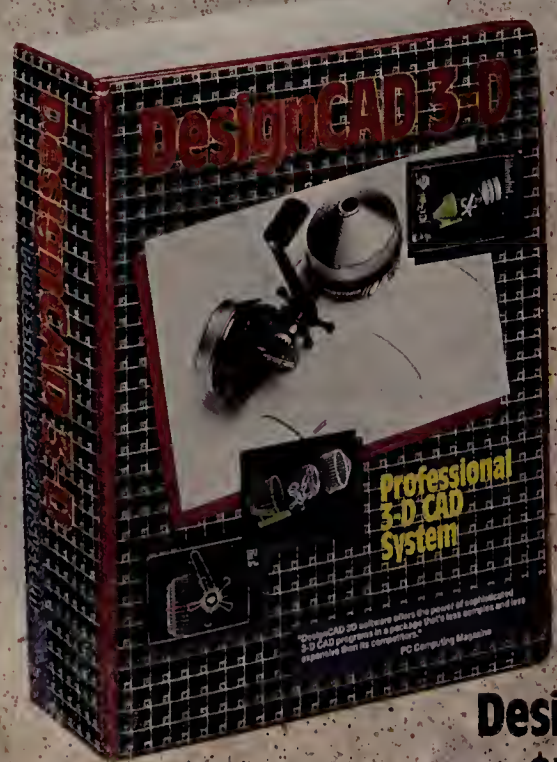

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(MicroCAD News review)

PC MAGAZINE EDITORS' CHOICE December 11, 1990 DesignCAD 3-D, Version 3.1

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The Art of Persuasion

Publishing & Graphics

Expert advice for creating high-impact documents and presentations

This month: streamlining data charts, and producing sharp printouts with Harvard Graphics

Richard Jantz

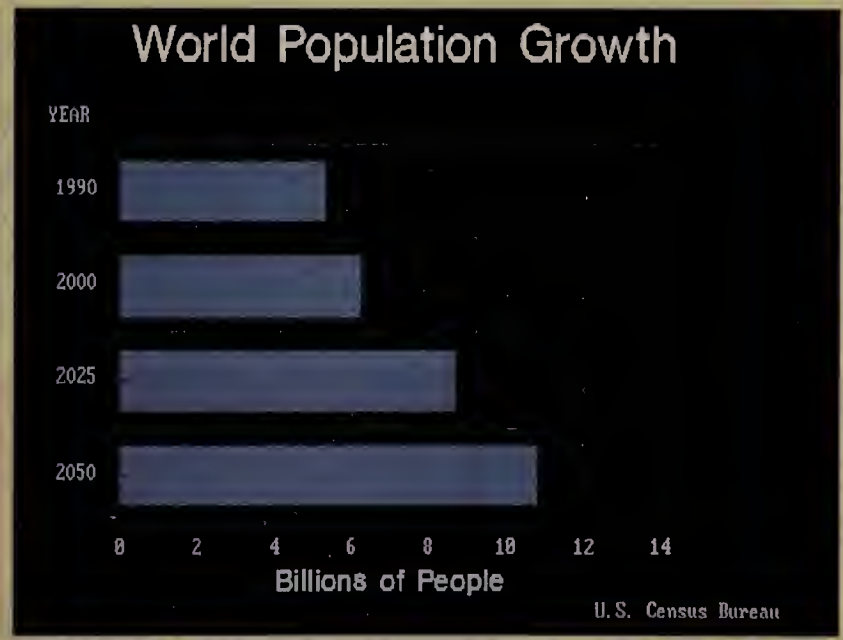
Numbers don't lie—but as any presentation pro knows, the story they tell can vary, depending on how you present it. Whether you're showing off soaring sales figures or proving why your department deserves a bigger slice of the corporate pie, the fastest way to do it is with data charts.

Every presentation package from *Harvard Graphics* to *Microsoft PowerPoint* lets you create a variety of charts, each good for showing specific types of data. For example, area and line graphs are best for plotting cycles or trends in data such as stock prices; bar graphs help compare data from different time periods, such as monthly sales or quarterly earnings; and pie charts excel at showing proportional relationships like market share.

But simply knowing when to use a particular chart isn't enough—you've got to get your point across quickly. Data charts generally take longer for an audience to absorb than text charts, especially when they're displayed as 35mm slides or overhead transparencies. The key is to make them as telegraphic as possible: Show the big picture in the chart, and save the details for handouts. Here are some tips for streamlining your presentation's data charts.

- When possible, show trends rather than details. For example, in a bar chart with two sets of annual data—sales and expenses, say—show data by quarters rather than months. The fewer bars in a chart, the easier it is to understand.
- Treat chart titles as headlines, using active verbs to convey your message. The title "Worldwide Sales" identifies a chart, but "Worldwide Sales Explode" tells a story. Use subtitles, set slightly smaller, to expand on your message.
- Add brief units of *floating text* to explain crucial chart data, and link it to the data using a line or arrow. For exam-

A World of Difference



In this Harvard chart, the information is there but the message is obscured, thanks to a bland title and data values that are hard to decipher.

An active headline and eye-catching graphic make this chart's message hard to miss. Placing numbers inside the bars provides instant access to data.

NUTS & BOLTS

Better Printing With Harvard

Harvard Graphics 2.3's broad range of color palettes makes it easy to improve the look of your 35mm slides. But a palette that looks great on screen can still produce poor black-and-white laser printouts. The reason? Some palettes may convert different colors to the same shade of gray, making it hard to distinguish between, say, adjacent bars in a cluster bar chart.

Fortunately there's an easy solution. When you want to print, simply switch from your current palette to *Harvard*'s default palette (HG23.PAL), which is optimized for color-to-gray conversions. Here's how to do it.

1. Open *Harvard* and retrieve the chart.

2. At the main menu, press <**F8**> to display the Current Chart Options menu. At *Palette file:*, delete the current palette, type **HG23**, and press <**Enter**>.

3. Press <**Ctrl**>-**P** to display Print Chart Options, select *Quality: High* and *Color: Yes*, then print the chart.

Finally, to keep your original color palette intact, don't save the chart before exiting from *Harvard*. —*R. J.*

ple, "New product launch" might point to a sharp increase in production costs on a line chart. Make this text larger than the chart's labels but smaller than its subtitle, and put it in a box to make it stand out.

- Avoid rotated or vertical text. Use horizontal labels in line and bar charts to identify values or categories on each axis (the horizontal and vertical lines that define a chart's coordinates). Keep labels brief by using abbreviations (such as *$* for *dollars*).
- Avoid redundancy. If you list the year in the chart's title, you don't need to repeat it in the labels.
- Use the brightest color or boldest pattern to highlight important data in area, bar, and pie charts (or the thickest line width for line charts). Place a *legend*, or key, that identifies the colors, patterns, or line widths in a box above or below the plotted data.
- For complex charts where numbers are especially important to your audience, show the *actual values* (numerical data such as percentages) inside or near the plotted data, as shown in the figure. You rarely need to display all the data; in a line chart, for example, you can get away with just the high and low values.
- To emphasize upward trends (such as rising profits) in line or bar charts, place the vertical (y) axis line on the right side instead of the left. If your chart displays the actual values, you can probably eliminate the y-axis altogether.
- Eliminate unnecessary elements in line and bar charts, such as grid lines. If possible, use tick marks (short hash marks along the y-axis), or include the actual values themselves.
- Use a clip-art image *only* if it reinforces the chart's content. For example, it's appropriate to add a world map to the background of a chart displaying international sales data. You also might want to place your company's logo on the top or bottom of all your slides. But be sure to use graphic images consistently, or they'll disrupt the flow of your presentation.

Charts are tools to aid your presentation, not overwhelm it. If your audience has to tune you out to decipher a chart's figures, it's not doing its job—and neither are you.

Contributing Editor Richard Jantz is the author of Ventura for Windows 3.0 *(John Wiley & Sons, New York, 1991).*

POWER TIP NO. 177

Self-Stick Wallpaper for Windows 3.0

Tired of the same old blank walls? *Windows 3.0*'s desktop lets you customize the background (pattern) and the display (wallpaper). First, scan your company logo or digitize a favorite photo, edit the results with *Windows Paintbrush*, and save the graphic as a bit map. Make sure the file name ends with the extension .BMP, copy the file to your main *Windows 3.0* directory, and then run the Control Panel utility from Program Manager's Main Group. Next, select the Desktop icon, and choose the bit map's file name from the Wallpaper section. You can select the *Center* button to display a single copy of your artwork midscreen, or choose *Tile* to replicate a pattern to the far corners of your display. To reset the display to its original background, set Wallpaper to *[None]*.

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San Diego, California

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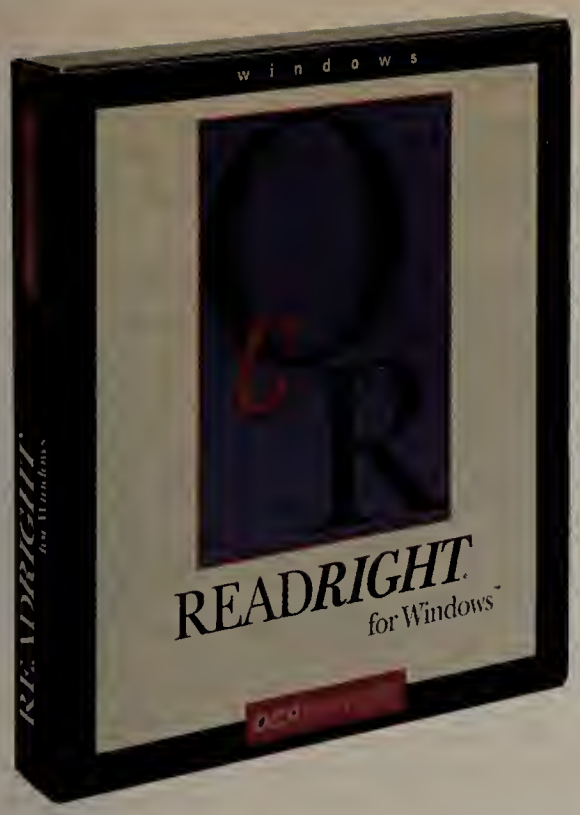
Introducing ReadRight for Windows



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Good OCR shouldn't cost you a fortune. That's why OCR Systems has offered high-quality, affordable OCR products for more than 20 years. Products like ReadRight 2.01, which for the last two years has won the *Publish* Reader's Choice Award for PC OCR software. And which the *Seybold Report on Desktop Publishing* said "impressed us in virtually all areas."

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Windows 3.0	✔	✔	✔	✔	✔
'286 Compatible	✔	✔	No	✔	No
Point Size	6-72	6-28	6-72	6-28	6-72
Built-in Dictionary	✔	✔	✔	✔	No
Error Verifier	✔	✔	✔	No	No
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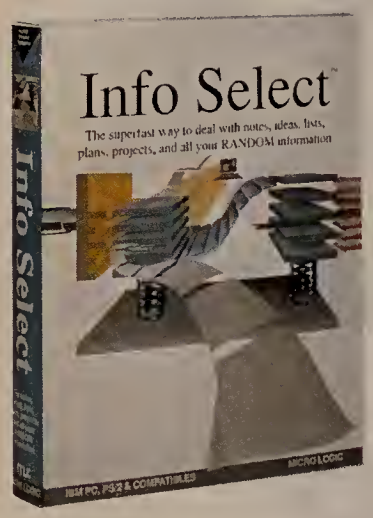

and much more. INFO SELECT™ will not only give you instant access to this important information ... it will help you make better decisions and see important new relationships. Try INFO SELECT risk-free and discover a whole new dimension of computing.

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Have you ever worked on a complex project and felt lost? With INFO SELECT you'll group, scan, and cross search through all your notes so fast you'll see the big picture in seconds.

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Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.

Phone notes

Client info

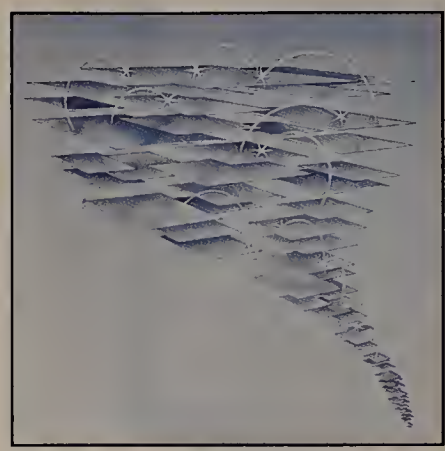
Decisions

Management

The #1 PIM

What's all the fuss about PIMs (Personal Information Mangers)? Simple - you probably have more RANDOM information than any other type and you need a PIM to properly handle this kind of information. The right PIM will save you time and make everything you do go smoothly.

Why is Info Select the #1 PIM? Because Info Select is based on ideas you can identify with - like stacks of paper. And it's free-form too. You won't waste days or weeks learning complex structures. Instead you'll be up and running in minutes. Info Select also does more and costs less than other PIMs.



Owners of our TORNADO software (symbolized by the famous "blue tornado") can trade up to the second-generation Info Select under our special offer. There are over 200 improvements.

Feature packed

INFO SELECT is memory resident (if you choose), so you can quickly jump in from other programs. Info Select windows can hold: notes, plans, lists, facts, letters, contacts, and much more. You can search for a window or a group of windows related by a word or phrase. There are five ways to see overviews; hypertext, a fast sort, and line drawing. Save time with the dialer, date tickler; and searching by text or date ranges.

If you have notes, ideas, contacts or other unorganized RANDOM information, you need Info Select.

Info Select allows you to: add columns of numbers; store data in EMS; use template or free-form windows; import and export files, screens, and databases; move, join, and duplicate windows and much more.

LAN option

The new LAN version allows integrated E-mail, sharing company rolodexes and distributing company policies. You can share any kind of information. It's your first step into the exciting new world of groupware! Ask about the five node LAN starter pack.

Easy power

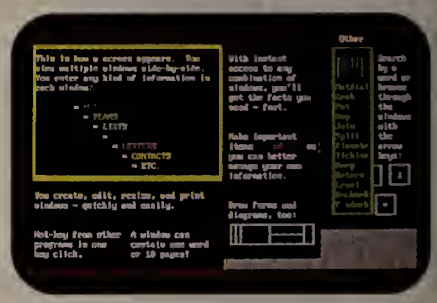
Info Select is easy to use yet offers the power you need with infobases up to 10 megabytes; text searches up to 700kb/sec; up to 32,000 characters per window; and up to 64,000 windows per infobase. Even better, Info Select can swap down to as little as 7K memory!

TORNADO owners

INFO SELECT is based on the pioneering TORNADO™ software PC World called "Excellent, Excellent, Excellent, Excellent" and PC Magazine awarded Editor's Choice - twice. Call about our special trade-up offer.

Endless uses

Info Select can do much more than manage all your RANDOM information. Use it to manage business correspondence, sales leads, orders, and client notes. Track facts, plan projects, or interrelate all your ideas. You can catalogue parts, documents, and inventory items. Match buyers and sellers or doctors and patients. Setup an information desk. Edit E-mail. Store notes on magazine articles, software operation techniques, or just names and addresses. Whether you are a lawyer tracking court cases or a zoologist collecting feeding habits you'll find countless uses for Info Select.



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The Information Edge

Communications

On-line resources for business and professional users

This month: Track down vital commercial information on CompuServe, and punch up show biz business via Baseline.

Judy Heim

CompuServe Information Service (CIS) is the biggest and most popular on-line service around, but its very size can be a problem. You suspect the information you need is available on CompuServe *somewhere*—but you can't remember where, and who has the time or money to hunt for it?

Here's a guide to a few obscure but indispensable CIS data bases and services. Unless otherwise noted, they're available at the basic hourly connect rate of $12.50, plus $1.50 per month for maintenance. All the data bases and message forums (also known as Special Interest Groups, or SIGs) are easy to access and use.

Q. *I want to start a home business. Where can I turn for help?*

A. The Working at Home Forum (type **go work**) offers a wealth of advice on running a home-based business, from setting up voice mail to handling typesetting, accounting, and mail order on your PC. The International Entrepreneur's Forum (**go usen**) specializes in business ventures, offering insight into launching a business. Both SIGs are populated by friendly experts who are happy to answer questions.

Q. *Where can I find free government information on business topics?*

A. Type **go infousa** and head to the amazing Information USA run by Matthew Lesko, an expert who can help you extract free advice from the government. This data base includes addresses, phone numbers, and descriptions of publications and programs ranging from Department of Agriculture information to low-interest home-buyer loans in each state. As a bonus, you get Lesko's columns on topics like "The Care and Feeding of Bureaucrats" and "The Art of Getting an Expert to Talk."

When you know what you want, you can order the most frequently requested publications on line. Just type **go gpo** to access the U.S. Government Publications service.

Q. *I want to bid on government contracts for goods and services. How can I get the latest on what Uncle Sam is looking for?*

A. The Commerce Business Daily (**go combus**) includes the full text of that newspaper, plus other government publications that provide up-to-the-minute scoops on federal contracts. You can search by subject, agency, ZIP code, or announcement type. There's a $2 surcharge for the search plus another $2 for each entry displayed.

ON-LINE SHORTCUT

The Voice-and-Data Shuffle

Remote access to office E-mail used to be a snap until your company signed up with a new long-distance carrier like Allnet that requires you to give an operator your long-distance access code—verbally—*after* you have begun dialing the number. How do you maneuver your modem through these negotiations? Try this: Load your communications software, and move to the blank terminal screen. Using your telephone keypad, enter the first part of the number. Tell the operator the access code over the phone. Then, as soon as the operator hangs up, set the receiver aside (but don't hang up!), and return to the PC. Type **ATDT**, followed by any numbers that remain to be dialed, and press **<Enter>**.

This trick will work only if your modem and phone can share the line, so be sure to carry a Y-plug, which snaps into the wall jack and gives you two jacks from one. —*J. H.*

THE PROFESSIONAL EDGE

Baseline: Backstage Business On Line

Michael Goodwin

There may be, as the song goes, no business like show business, but for all the glamour, it *is* a business—and a fast-moving one at that. Now, thanks to Baseline, a unique on-line service devoted to the film and TV industry, you can keep up-to-date by the minute. Over the last nine years, Baseline has become indispensable to production executives (who use it to track weekend grosses) and line producers (who can find contact numbers for actors and technicians). It's also a vital resource to videotape retailers, entertainment reporters, film programmers, researchers and librarians, theater owners, and entertainment lawyers.

Baseline's 30-plus data bases cover people, products, and news, and there are E-mail and chat areas. Most of Baseline's information is available elsewhere, but it's scattered among various sources, and paper reports lack the immediacy of Baseline's on-line data.

Talent hunting is Baseline's main charter—over 400,000 directors, writers, technicians, and actors are listed. Enter a name, and you'll see a list of film and TV credits, awards and nominations, a brief biography, an agent's phone number, and—most important for a harried production executive—whether he or she is available for work.

You can also type in the title of a film, a TV series, or even an episode of a series and get complete credits, the name of the distributor, and a readout of Oscars, Emmys, Tonys, and other awards and nominations as far back as 1970. More than 60,000 titles are included.

A tremendous variety of entertainment news and data is available, most of it updated daily: everything from domestic box office grosses and listings of festivals and conferences, to a selection of full-text stories from the latest video and broadcasting newsletters. Do you need a schedule of theatrical film releases for the next six months by title, date, and distributor? You'll find it in Release Schedule. Are you interested in upcoming novels available for acquisition? Look into This Week's Rights. Owners of videotape stores will find the Video Grosses data base useful for its sales and rental figures dating back to 1979. And there's lots more.

Baseline's colorful menu-driven interface is a pleasure, and the new version of its proprietary log-on software lets you use a mouse. The price is reasonable—you'll pay a one-time-only $497 fee; after that, charges range from nothing to $3 per minute, depending on the service and time of day.

If you're in The Biz, Baseline is a show you won't want to miss.

Baseline II, Inc., 838 Broadway, New York, NY 10003; 800/242-7546, 212/529-3330 (fax)
Reader service no. 602

Q. *How do I access the latest U.S. Census data on manufacturing, retail sales, business, and housing?*

A. All 1990 U.S. Census data is available on line, and it's free (**go cendata**). Menus make it easy to search this huge data base by topics such as agriculture, foreign trade, and population. You can download data, but no hard copy is available.

Q. *Where do I go for a list of all the ZIP codes in New Jersey where household income tops $50,000 a year and residents put a cellular phone at the top of their wish list?*

A. The Neighborhood Demographics service offers a number of data bases that combine census data with market research to offer intimate glimpses into buying patterns of American households (**go dem**) and neighborhoods (**go neighbor**). Generally you enter a ZIP code, SMSA number, or Nielsen or Arbitron neighborhood number and then select information from a menu. But be prepared to pay—reports range from $10 to $100 each, and some data bases are accessible only if you have CIS's Executive Service Option with its $10 monthly minimum.

Q. *I'm planning a trip to Peru. Is it safe?*

A. Type **go state** for the latest State Department travel briefings.

Poking around on CompuServe will reveal many more useful business resources. Have fun!

Judy Heim is a contributing editor and Michael Goodwin an associate editor for PC World.

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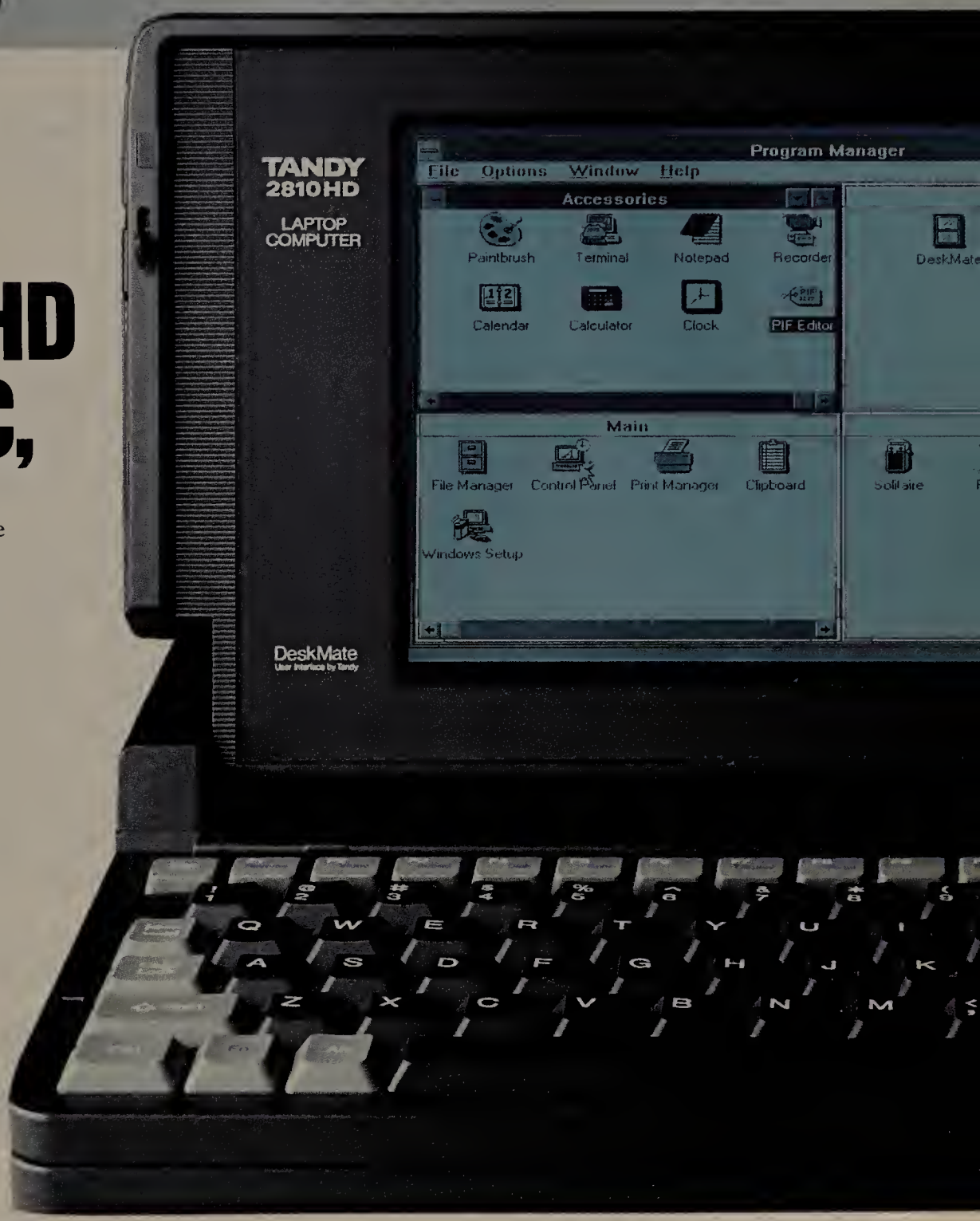

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The DeskMate Graphical User Interface with ten applications is installed on the hard drive for instant-on ease of use.

Resume Mode
Lets you shut off and come back right where you left off—also shuts down automatically to save battery life.

External Support
Attach a 101-key keyboard, a VGA color monitor, a printer, an external floppy drive and more.

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Expandable to five megabytes.

DESKTOP PERFORMANCE IN A 6.7-lb. PORTABLE

Continuing our tradition of innovation, the Tandy 2810 HD is a lightweight laptop for heavy use—at the office, at home, or on the road. With extremely durable construction, it's built for travel—but it can also support a full-size keyboard and monitor for true desktop power. AT® compatibility, stunning VGA graphics and DeskMate® productivity software. Only at Radio Shack. Again.

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Circle 284 on reader service card

A full-blown server-based network costs a bundle when done right. Add to this the cost of training and ongoing support (sometimes 2 to 3 times the original investment). Undaunted, businesses bite the bullet every day—effectively turning over their entire computer operations to a LAN expert forever. But many, in seeking a less costly alternative, fall into the trap of false economy.

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Connectivity and networking solutions abound. And with them come traps of all kinds. Unless you're a teflon-coated decision maker (or a job hopper), the solution you choose today should remain appropriate tomorrow. Let's look at where you can go wrong—and right.

First, consider printer sharing boxes. They're a fine short-term solution when you have two or three computers occasionally needing access to a single printer. But, when applied to more extensive or demanding applications, they become a bottleneck that impedes and frustrates users. Wouldn't you call this a bottleneck: a printer sharing box—driven by a *single* microprocessor—receiving print data from *several* computers, while it is simultaneously supposed to send this data to *several* printers? No wonder the makers of these boxes publish performance tests with only *one* user printing! And when the box locks up (as all computer devices do), everyone loses their printing. When it breaks, *nobody* can print until the box is replaced. To add insult to injury, they are often quickly outgrown because they have a finite assortment of inputs and outputs.

If not printer sharing boxes, then consider networks (LANs). They're a *hot* item nowadays, particularly because LANs are one of the few sources of profit left for computer stores. Good networks are EXPENSIVE, and require expert support forever! Guess who benefits from that? If you buy a LAN, you will always be accountable to it, like a state and federal sales tax on every change or addition you make related to your computers.

Not that there aren't inexpensive networks available to snare the penny wise. Some are downright cheap. But, should you build your business around them? Cheapo networks teach harsh lessons in false economy.

You see, some low-cost LANs boast they occupy very little memory (RAM), yet to realistically accomplish what the LAN is supposed to do, it really uses as much or more RAM as any other LAN. The truth is: *all* LANs occupy a rather substantial amount of RAM, and you will likely find yourself either having to add RAM to your PCs (if you can)—along with memory management software, or dumping some of your other software overboard.

An even harsher lesson in false economy comes later, when you buy a multi-user software package (e.g. a database to be shared) and discover it is only guaranteed to be compatible with a server-based data-sharing LAN, usually Novell's®. Oops! Old LAN overboard!

Want to avoid such harsh lessons? Rule number one: if and when your company has some computer users who need a data-sharing network—so they can simultaneously access a shared database—get the best network and server money can buy. Buy a UPS, tape backup... the works. Make the commitment. It's a big step, but you'll regret anything less.

It's highly unlikely, however, that ALL your computer users need—or will ever need—access to a shared database. Most probably just need to share printers and other peripherals like plotters, modems and fax machines. Perhaps everyone would also like to exchange E-Mail and maybe even pass data files between PCs electronically.

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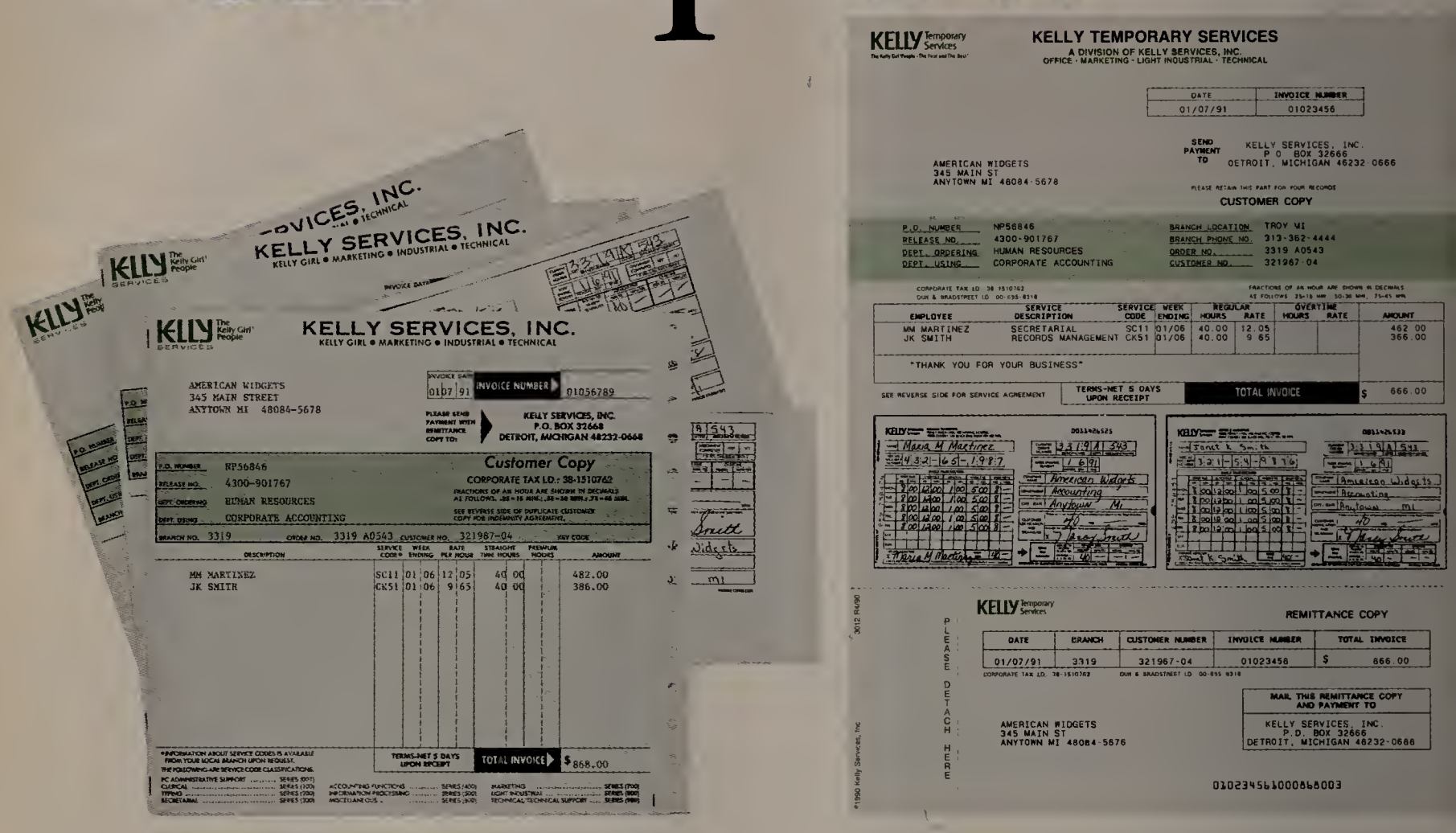

(Before) (After)

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Circle 142 on reader service card

User Group Tips

Helpful hints from members of the nation's user groups

Paradox Picture Formatting

Paradox's Picture command lets you format your input. For instance, it can automatically capitalize the first letter of each word you enter in a field. To set up this format, View the table and put the cursor on the field you wish to format. Press <**F9**> to edit, then <**F10**>. Select *Valcheck Define* and press <**Enter**>. Select *Picture,* type *{!*?[]}, and press <**Enter**><**F2**>. Now, *Paradox* will automatically capitalize the first letter of any word entered in that field.

Ed Hyde
Southern California Paradox Users Group (LAPALS)

Faster Batches, Quicker Copies

Using repeated ECHO statements to display long messages slows batch file execution. It's more efficient to have the batch file use DOS's TYPE command to print small message files on screen. This method has the bonus of allowing you to create attractive, centered screens that include borders, arrows, or anything else that can be made with ASCII characters. Also, instead of beginning nonprinting comment lines with 'rem', turn them into labels by starting them with a colon.

Use CPY.BAT to speed copying of files from the default disk drive to another drive by copying only those files that don't exist on the second drive: Type **for &&f in (%1) do if not exist %2%%f copy %%f %2**. You invoke CPY.BAT by typing **cpy** followed by a space and the file and directory specifications. For example, **cpy *.doc a:** copies all DOC files from the default drive to drive A:. Keep in mind that path names won't work with CPY.BAT unless corresponding directories exist on both disks.

Bill Weil
San Francisco PC Users Group

A Batch File to Get You Started

You can use a bunch of short, individual batch files to start separate applications. However, each file costs you 2K to 4K of disk space (depending on your disk's cluster size) even though its directory listing says it's a few bytes long. START.BAT [see **LISTING 1**] shows how to combine start-ups into one batch file. It has the proper structure to start *Excel* and *Word* and return to the \JUNK directory (which must exist, of course) after exiting. You can easily modify this batch file for your own applications. Store START.BAT in a directory listed in your PATH command (\BATCH, say).

Each group of code executes the appropriate directory changes, setups, and program files. The parameters %2, %3, and so on permit passing switches and other program parameters.

```
cls
@echo off
goto %1
goto end

:excel
c:
cd\excel\files
\excel\excel %2 %3 %4 %5
goto end

:word
c:
cd\word\doc
\word\word %2 %3 %4 %5
goto end

:end
c:
cd\junk
```

LISTING 1: START.BAT combines the start-ups for Microsoft Word and Excel in one file.

It's always wise to store data files separately from program files. In the *Word* example, DOC files are stored in the \WORD\DOC directory and program files in the \WORD directory. Hence, \WORD\WORD %1 %2... provides the path to WORD.EXE and executes it while keeping \WORD\DOC as the document directory. To start *Word* and load the last edited document, type **start word /l** at the DOS prompt.

Bruce D. Wedlock
Boston Computer Society

Remove TSRs for a Secure Backup

To achieve maximum data security, remove RAM-resident programs before running your backup program. Many backup utilities, such as *PC Tools Deluxe*'s PC Backup and Symantec's *Norton Backup,* use the computer's DMA controller to simultaneously read from and write to floppy disks. The DMA controller handles disk access, freeing up the microprocessor for other tasks and thereby improving system performance. But any TSRs, including the TSRs in *PC Tools* itself, may interfere with the DMA controller's performance. Thus, files you think are backed up and verified may actually be unreliable. You can never be too secure, so if your AUTOEXEC.BAT loads TSRs, boot your computer using a DOS system disk before backing up.

Howard Wexler
Westchester PC Users Group

Are you a user group member with a tip to share? Send it to User Group Tips, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax)—include your phone number. We pay $50 and throw in a* PC World *T-shirt for each tip we use—and you get to see your name in* PC World.

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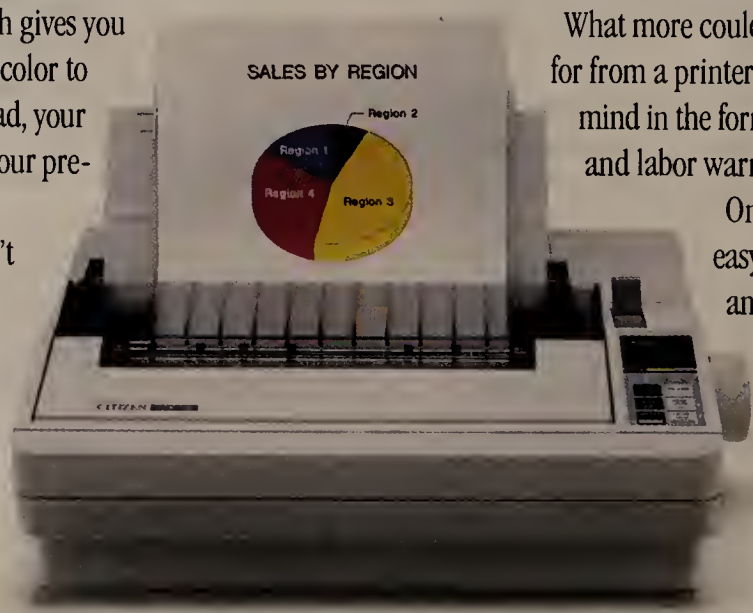

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Crank out repetitive commands with a 1-2-3 macro, write QuickBASIC programs that locate their home directories, put the moves on DOS, enter dashing WordPerfect text, and get something for nothing in dBASE.

Edited by Tom Swan

Repeat Business

When you need to repeat a few keystrokes in *1-2-3* but won't need to repeat them in the future, writing a full macro may be more trouble than it's worth. To simplify the job of creating throwaway commands, I wrote a macro that records keystrokes and plays them back a specified number of times.

To create the macro, enter the text in **FIGURE 1**, being sure to preface \R and \P with an apostrophe ('). Then use */Range Name Labels Right* to create range names from the cells in AA1 through AA17. To see how the macro works, move to a blank cell and press **<Alt>-R** to begin recording. Type the keystrokes you want to repeat, then press **<F10>** to stop recording. Move to another cell, and press **<Alt>-P**. Enter the number of repetitions, and press **<Enter>**. The macro will then type your keystrokes as many times as you've specified.

William O. Johnson
Racine, Wisconsin

Editor's note: The macro is limited to 480 characters, but the number of keys it can store may be less, as some keys take more than one character. For example, <Cursor Down> is represented as {DOWN}.

Where Am I?

In a sense, a running BASIC program is lost—it doesn't know its name or its path, a fact that poses a problem for programs that must access files in their home directories. I solved that problem by taking advantage of a little-known DOS feature.

When DOS runs a program, it stores the program's path and name after the last environment string. For a BASIC program to find its roots, it must locate the Program Segment Prefix (PSP), which is attached to the program at run time. From the PSP, the program can find out the directory from which it was loaded. It's then a simple matter to lop off the path, attach the file names you need, and use the results to access data in the program's home directory. I've included a sample program [see **LISTING 1**] that shows how this is done.

H. B. Clyde, Jr.
Incline Village, Nevada

Editor's note: I modified Mr. Clyde's program so you can compile it with the popular QuickBASIC 4.5. *When run, the program displays its directory path and file name.*

Before compiling, start Quick-

(continues)

```
     AA          AB          AC          AD          AE          AF
1  \R          {let str1,""}{let str2,""}{let counter,0}{store}
2
3  str1
4  str2
5
6  store       {get char}
7              {if char="{graph}"}{return}
8              {let counter,counter+@length(char)}
9              {if counter>240}{branch fillstr2}
10             {let str1,+str1&char}{branch char}
11 fillstr2    {let str2,+str2&char}
12 char
13             {branch store}
14
15 repeat
16 counter
17 \P          {getnumber "How many repetitions? ",repeat}
18             {for counter,1,repeat,1,str1}
```

FIGURE 1: Use this 1-2-3 macro to record and play back keystrokes.

ANTHONY RUSSO

BASIC *with the /L parameter so that the Quick Library QB.QLM, which contains support routines needed to call DOS functions, is also loaded. The program uses one of those routines, CALL Interrupt, to locate the PSP.*

In the listing, comments beginning with an apostrophe explain how the program works. The second line, however, is not a comment but a command to include QB.BI, which defines RegType, a structure that stores pseudo register values to pass to DOS and to receive information back.

Good Moves

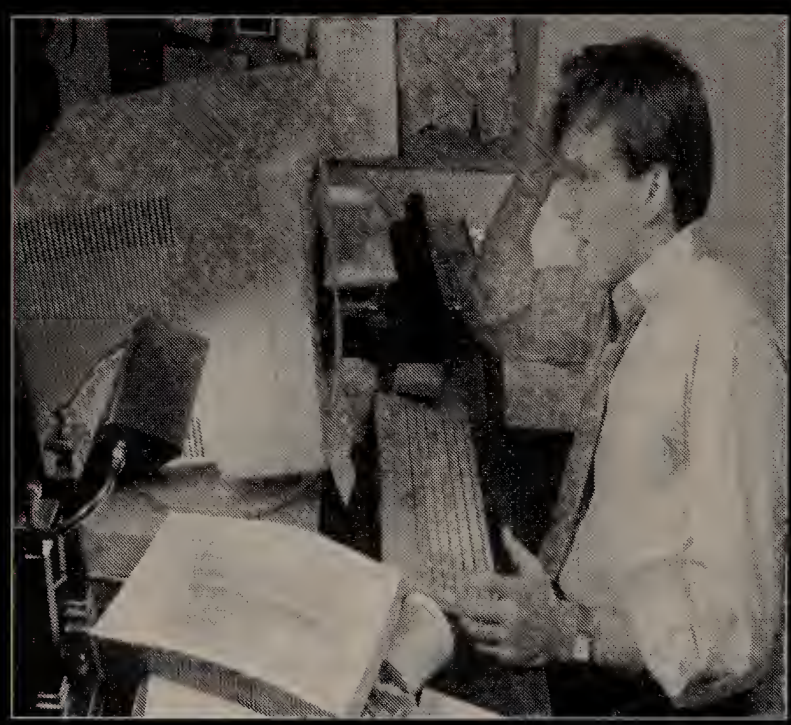
I often move files from one directory to another. Since I don't want duplicate files cluttering my disk, I created a batch file, MOVE.BAT [see **LISTING 2**], that copies and deletes files with one command.

To avoid accidentally deleting important files, I built safeguards into the batch file that ensure a safe and happy move. Errors are reported if the destination file already exists, if you mistype a file name, or if you specify a nonexistent directory.

Bruce Purcell
Elk Grove, California

(continues)

So You're Feeling Squeezed



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```
' FINDPATH by H. B. Clyde, Jr.
' $INCLUDE: 'QB.BI'
' Find Prog Seg Prefix (PSP)
DIM regs AS RegType
regs.ax = &H6200
CALL Interrupt(&H21,regs,regs)
' Locate program's environment
PSPSegment = regs.bx
def seg = PSPSegment
offset = &H2C
LoAdd = peek(offset)
HiAdd = peek(offset + 1)
EnvSeg = LoAdd + (256 * HiAdd)
' Find command string
def seg = EnvSeg
x = 0
while peek(x) + peek(x+1) <> 0
  x = x + 1
wend
' Find end of program's path
StartField = x + 4
EndField = StartField
while peek(EndField) <> 0
  EndField = EndField + 1
wend
' Locate backslash at path end
EndPath = EndField
while peek(EndPath) <> &H5C
  EndPath = EndPath - 1
wend
' Copy path name to string
for x = StartField to EndPath
  Path$ = Path$ + chr$(peek(x))
next x
print "Path = "Path$
' Copy program name to string
for x = EndPath + 1 to EndField
  Prog$ = Prog$ + chr$(peek(x))
next x
print "Program = " Prog$
end
```

LISTING 1: FINDPATH.BAS demonstrates how a QuickBASIC program can locate its own path.

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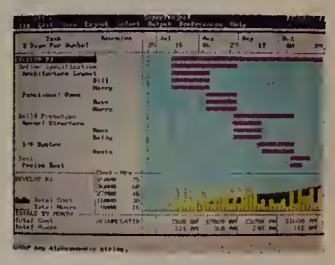

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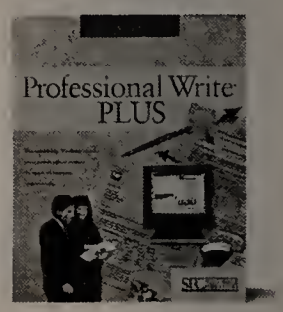

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Editor's note: Copy MOVE.BAT to a directory in the current PATH. Then type **move** file dir, *where* file *is the path and file name of the file to move and* dir *is the destination. For example, MOVE NAMES.DAT C:\BACKUP moves NAMES.DAT to C:\BACKUP and then deletes the original file. If you attempt to move a file to a nonexistent directory, MOVE.BAT will ask for confirmation before creating the directory. MOVE.BAT has its limits; because it looks for '%2\%1' when error checking, the batch file can't move a file to the root directory.*

I added a PAUSE command that lets you press <Ctrl>-C after copying if you want to save the original file. If you don't want this option, remove the first PAUSE and the three preceding ECHO statements.

```
echo off
if not exist %1 goto NOFILE
if exist %2\%1 goto FILEERR
goto MOVEIT
:NOFILE
echo %1 not found. Check
echo your typing, then
goto ERREND
:FILEERR
echo %2\%1 already exists.
echo Delete duplicate and
goto ERREND
:MOVEIT
copy %1 %2 >nul
if not exist %2\%1 goto DIRERR
echo %1 moved to %2
echo Press Enter to delete
echo original file, or press
echo Ctrl-C and Y to quit.
pause
del %1
goto END
:DIRERR
echo N | del %2
echo Directory %2 not found.
echo Press Enter to create the
echo directory and move the file
echo or Ctrl-C and Y to quit.
pause
md %2
goto MOVEIT
:ERREND
echo try again.
:END
```

LISTING 2: MOVE.BAT moves a file to a new directory and then deletes the original file.

Dashing Through the Text

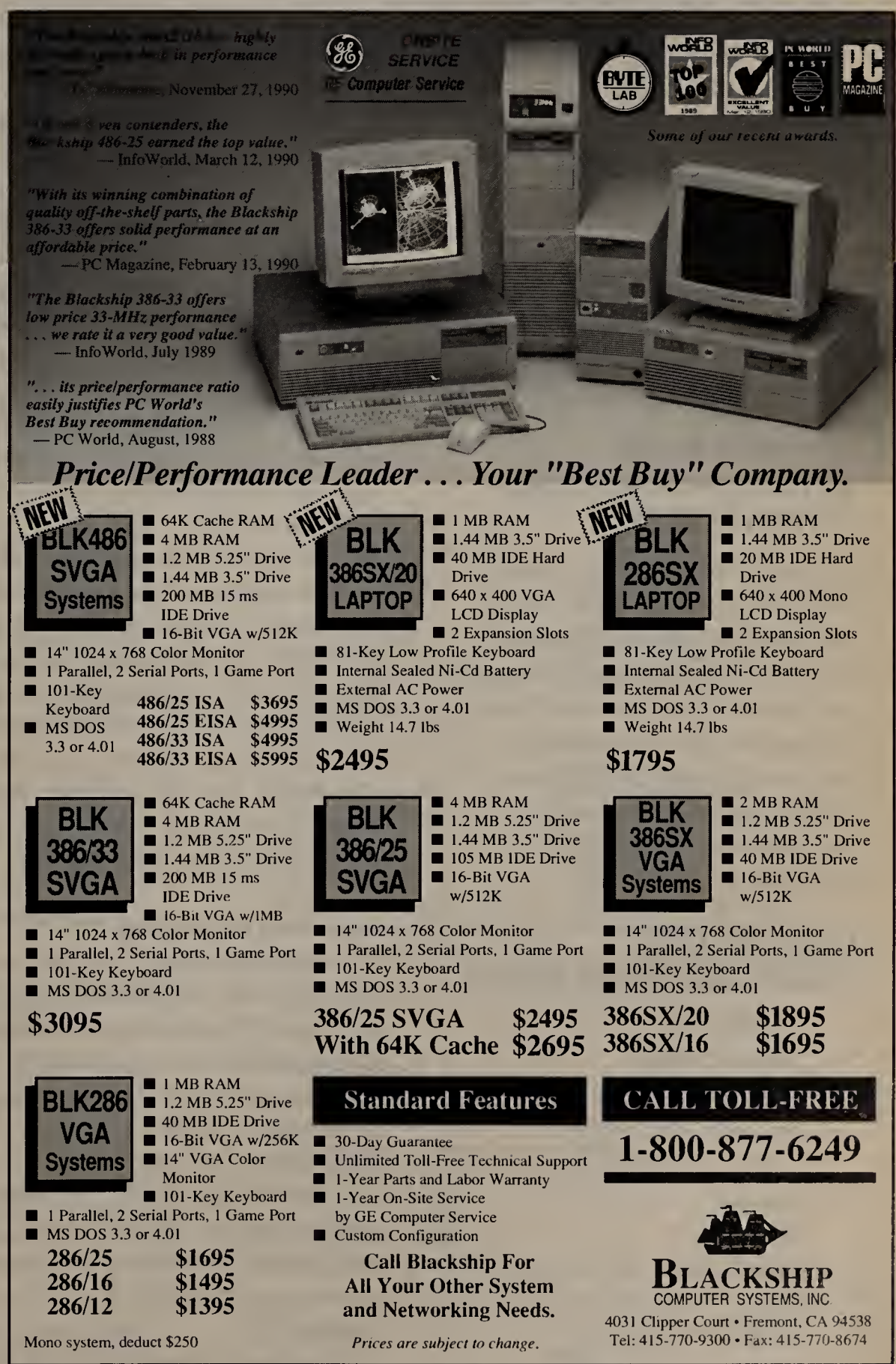
I like to give my *WordPerfect* documents a professionally typeset look by using em dashes—like these—in mid-sentence. Enter the keystrokes in **FIGURE 2** to create an em dash macro.

To use the macro, press **<Alt>-M**. You'll see a hyphen on screen, but what's

(continues)

```
<Ctrl>-<F10>
<Alt>-M
Em Dash<Enter>
<Ctrl>-V
4,34<Enter>
<Ctrl>-<F10>
```

FIGURE 2: Enter this WordPerfect macro, then press <Alt>-M to add em dashes to documents.



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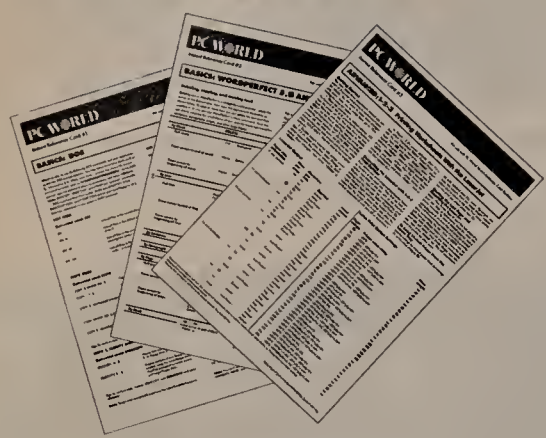

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actually stored is the code [-:4,34], which selects symbol 34 from the fourth character set. For a professional look, don't insert spaces around your em dashes. Just butt them against the text that comes before and after the dashing dash.

Kay Koschnick Freeman
Syracuse, New York

Editor's note: WordPerfect *provides about 1500 symbols in 12 character sets, and this macro is a good guide for creating macros for the others. If your printer doesn't support a character,* WordPerfect 5.1 *will print it as a graphic, assuming you have a graphics printer. So before using these symbols, press* **<Shift>-<F7>** *to bring up the Print/Options menu, and set Graphics to* Medium *or* High.

If you're using version 5.0, however, you may not be able to print em dashes or certain other special symbols. If you have trouble printing em dashes, try **3,8** *in place of '4,34'.*

If that doesn't work, you need to investigate which symbols your printer can handle. The value pairs represent a character set and symbol number, respectively. To get a complete list of available characters—and see how they look on your printer—print the CHARACTR.DOC file provided with WordPerfect. *(This file is named CHARMAP.TST in some versions.)*

Something for Nothing

In "Losing Your Memo" (*Star-Dot-Star*, November 1990), we described a way of loading *dBASE* data when a DBT memo file is missing and presumed unrecoverable. Two readers have since suggested an alternative method. Just create a zero-length file with the same name as your DBF file and the DBT extension. Although the file contains nothing, it fools *dBASE* into thinking the memos are intact and therefore lets you load your DBF file.

To create the empty file, enter the command **type** > *filename*.**dbt** at the DOS prompt. Type carefully; if the DBT file still exists, the command will erase it. After typing the command, you'll get an 'Invalid number of parameters' error; don't worry about it. Thanks to Jean Heriot of St. Thomas, Ontario, Canada, and Tim Erikson of Delavan, Wisconsin, for showing that you *can* get something for nothing.

Tom Swan is a contributing editor for PC World *and the author of* Learning C++ *and* Mastering Turbo Debugger *(Howard W. Sams, Carmel, Indiana, 1991, 1990).*

Have a macro, batch file, short program, or general tip you're proud of? Star-Dot-Star *pays $25 to $200 per tip used. Send your tips, c/o* Star-Dot-Star, *via CompuServe at 74055,412, MCI Mail at PC World Editorial, fax at 415/442-1891, or mail to* PC World, *501 Second St. #600, San Francisco, CA 94107. We cannot acknowledge submitted materials.*

POWER TIP NO. 178

DOS Windows Front and Center

If you maximize a DOS application's window and then move it with the mouse, it's hard to center that window perfectly at the top of the screen. But don't sweat it—*Windows* will do it for you. Select the maximized window, and press **<Alt>-<Enter>** twice. This pops the window into text mode and then back to graphics mode, which compels *Windows* to automatically recenter the window at the top of the screen. The positions of inactive windows are not affected by this trick.

Tom Swan
Contributing Editor

PC WORLD

Instant Reference Card # 12

For use with PC World Instant Reference Card Portfolio

BASICS: PARADOX 3.0 and 3.5

What to do: You can select a *Paradox* menu item by using the cursor keys (including **<Home>** and **<End>**) to highlight it and pressing **<Enter>**. A quicker way is to type its initial letter. The normal view of a data base is a table with multiple records. You can also view a single record in a form.

GETTING AROUND

Open/reopen menu	**<F10>**
Return to table/last menu	**<Esc>**
Get help	**<F1>**
Toggle table/form views	**<F7>**
Quit *Paradox*	**<F10>** **E**xit **Y**es
Go to DOS temporarily	**<Ctrl>-O** or **<Alt>-O**
Return from DOS	Type **EXIT** and press **<Enter>**

In Table or Form View

View first/last field	**<Ctrl>-<Home>/<Ctrl>-<End>**
View first/last record	**<Home>/<End>**
Move up/down one table	**<F3>/<F4>**
Go to named field or column	**<F10>** **I**mage **Z**oom **F**ield, select or type field name
View specific record number	**<F10>** **I**mage **Z**oom **R**ecord, type record number
Find first occurrence of a value	**<F10>** **I**mage **Z**oom **V**alue, select column, type value; or select column, press **<Ctrl>-Z**
Find next occurrence	**<Alt>-Z**

Note: Search values are case sensitive. They can be up to 175 characters long, and spaces are significant. You can use Field View (**<Alt>-<F5>**) to edit entries. Wild-card characters (.. for a series of characters, @ for any single character) eliminate case sensitivity.

In Table View

Move left one field	**<Cursor Left>** or **<Shift>-<Tab>**
Move right one field	**<Cursor Right>** or **<Tab>** or **<Enter>**
Move up/down one record	**<Cursor Up>/<Cursor Down>**
Move left/right one screen	**<Ctrl>-<Cursor Left>/<Ctrl>-<Cursor Right>**
Up/down one screen	**<Page Up>/<Page Down>**

In Form View

Go to next field	**<Cursor Down>** or **<Cursor Right>** or **<Tab>** or **<Enter>**
Go to previous field	**<Cursor Up>** or **<Cursor Left>** or **<Shift>-<Tab>**
Go to same field of next/previous record	**<Ctrl>-<Page Down>/<Ctrl>-<Page Up>**

Tip: In Table or Form View, the next field after the last (rightmost or bottom) field is the first field of the next record. The status indicator in the upper left corner of the screen tells you the table and record you are currently in and the number of records in the table. In Form View, pointers in the upper right corner indicate records above and/or below the current record.

In Field View

Move left/right one character	**<Cursor Left>/<Cursor Right>**
Move left/right one word	**<Ctrl>-<Cursor Left>/<Ctrl>-<Cursor Right>**
Go to first/last character	**<Home>/<End>**

GETTING AROUND (continued)

In Form and Report Design

Go to first/last line	**<Home>/<End>**
Go to beginning/end of line	**<Ctrl>-<Home>/<Ctrl>-<End>**
Move left/right one screen	**<Ctrl>-<Cursor Left>/<Ctrl>-<Cursor Right>**
Move up/down one screen	**<Page Up>/<Page Down>**

CREATING A TABLE

Initiate a new table	**<F10>** **C**reate, type table name
Add new fields	Type field name, **<Tab>**, type field type and size
Delete field name or type	**<Ctrl>-<Backspace>**
Complete creation	**<F2>**

Note: Alphanumeric fields (A) can be 1 to 255 characters; long numbers (N) have 15 significant digits; short numbers (S) are whole numbers between –32,767 and 32,767; dollars ($) have 2 decimal places, thousand separators, and parentheses around negative numbers. Field names can have up to 25 characters but cannot contain " [ ] { } ( ) or # or the combination ->.

EDITING A TABLE

Open existing table	**<F10>** **V**iew, select or type a table name
Enter edit mode	**<F9>** or **<F10>** **M**odify **E**dit
Leave edit mode	**<F2>** or **<F10>** **D**o-it
Restore changes, leave edit	**<F10>** **C**ancel

In Table or Form View

Insert a new record	**<Insert>**
Delete character to left	**<Backspace>**
Delete field contents	**<Ctrl>-<Backspace>**
Replace field contents	Delete old contents and type new contents
Delete a record	**<Delete>**
Undo editing changes	**<Ctrl>-U** or **<F10>** **U**ndo (6 times)
Add a new record—Table View	**<End><Cursor Down>**
Add a new record—Form View	**<End> <Ctrl>-<Page Down>**

Note: In Table or Form View you can replace a field or add or delete records. To clear a field for editing, use **<Backspace>**. You can overtype individual characters in Field View (when the cursor is a shaded box).

In Field View

Enter Field View	**<Ctrl>-F** or **<Alt>-<F5>**
Leave Field View	**<Enter>**
Delete character under cursor	**<Delete>**
Toggle insert/overtype	**<Insert>**

ENTERING DATA

Enter data in edit or data entry mode. Data entry mode displays only new records, which are added to the data base when you press **<F2>**.

Start data entry	**<F10>** **M**odify **D**ataEntry, select or type table name
End data entry	**<F2>**
Duplicate field entry of previous record	**<Ctrl>-D**
Enter current date	**<Space>** in a date field
Enter current year	Omit year in a date entry

Fold Here

Fold Here

PC WORLD

Instant Reference Card # 12

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ADVANCED: PARADOX 3.0 and 3.5

QUERYING A TABLE

Initiating a query produces a query form on which you specify the fields and records that are to be displayed in an answer table. An answer table must be renamed (**<F10>** **T**ools **R**ename **T**able **<Enter>** **<Enter>**, type new name, **<Enter>**) before you quit or it is lost.

Initiate a query	**<F10>** **A**sk, select or type table name
Include field	**<F6>** in field
Include field with duplicates	**<Alt>-<F6>** in field
Include field, descending sort	**<Ctrl>-<F6>** in field
Include all fields	**<F6>** or **<Alt>-<F6>** in leftmost field
Select record(s)	
matching a value	Type value in field
in a range	Type range in field using >/</>=/<=
similar to value	Type **LIKE** and value in field
not matching a value	Type **NOT** and value in field
that are blank	Type **BLANK** in field
matching today's date	Type **TODAY** in field
matching two values in field	Type first value, a comma, second value
matching either value in field	Type first value, **OR**, second value
matching all values in fields	Type values in several fields on one line
matching any values in fields	Type values in fields on different lines
Perform the query	**<F2>**
Save a query form	**<F10>** **S**cripts **Q**uerySave, type name

Fold Here

Tip: Values are case sensitive unless they use wild cards (.. for a series of characters, @ for one character). Blanks are significant. Avoid thousands separators. If a value includes a comma or a query keyword (e.g., Like, Not), enclose it in quotes. Use a backslash (\) before normal quotes in a value. Enter dates as mm/dd/yy, dd-mon-yy, or dd.mm.yy.

QUERYING SEVERAL TABLES

Initiate a query for each table and identify fields and selection criteria. For each occurrence of a specific linking field, press **<F5>**and enter the same value (e.g.,123, x). Press **<F2>** to carry out the query.

MODIFYING A TABLE

Initiating a sort produces a sort form listing fields in the table. Type **1** in front of the primary sort field, **2** in front of the secondary field, and so on. Normal sort order is ascending; type **D** after the sort number for descending order. Initiating a table restructure creates a Struct table listing the field names, field types, and sizes of alphanumeric fields. Reorder a field by inserting a new row and typing an existing field name in it.

Sort a table	**<F10>** **M**odify **S**ort, select or type table name, select **S**ame or **N**ew table, (for unkeyed tables), type table name if new, identify fields to sort on, **<F2>**
Initiate a table restructure	**<F10>** **M**odify **R**estructure, select or type table name
Add a field	**<Insert>**, type field name, **<Tab>**, type field and size
Delete a field	**<Delete>**
Change name/type/size	Type over old name/type/size
Carry out a table restructure	**<F2>**
Copy a table	**<F10>** **T**ools **C**opy **T**able, select or type table name, type new name
Add a table to another	**<F10>** **T**ools **M**ore **A**dd; select or type source table name, then target table name

MODIFYING A TABLE (continued)

Delete a table	**<F10>** **T**ools **D**elete **T**able, select or type table name, **O**K
Delete all records in table	**<F10>** **T**ools **M**ore **E**mpty, select or type table name, **O**K

Tip: Tables to be added must have similar field type, size, and order.

Note: Copying a table also copies the forms, reports, and indexes for that table. **T**ools **C**opy also enables you to copy just a form, a report, a script, or a graph's settings, or all the table's items (**J**ustFamily).

CHANGING THE SCREEN IMAGE

Change column size	**<F10>** **I**mage **C**olumnSize, move to column, determine width
Change number of records displayed	**<F10>** **I**mage **T**ableSize, determine length
Reformat column	**<F10>** **I**mage **F**ormat, move to column, select format type and number of decimals
Move column	**<F10>** **I**mage **M**ove, select field to move, identify new position of field
Save image settings	**<F10>** **I**mage **K**eepSet
Move column to right side	**<Ctrl>-R**
Close current image	**<F8>**
Close all images	**<Alt>-<F8>**

Fold Here

CREATING AND PRINTING REPORTS

Print instant report	View table to be printed, **<Alt>-<F7>**
Initiate a custom report	**<F10>** **R**eport **D**esign, select or type table name, select report, type description, select Tabular or Free-form

Note: Initiating a report design displays the headings and fields on the standard report. Modify by typing over or deleting the titles and headings; rearranging, deleting, or adding fields; and grouping records.

Move column to right side	**<Ctrl>-R**
Delete a report line	Move cursor to start of line, **<Ctrl>-Y**
Toggle insert/overstrike	**<Insert>**
Add a field	**<F10>** **F**ield **P**lace, select type and field, identify location and characters to display
Delete a field	**<F10>** **F**ield **E**rase, identify field
Add a column	**<F10>** **T**ableBand **I**nsert, identify location
Delete a column	**<F10>** **T**ableBand **E**rase, identify column
Move a column	**<F10>** **T**ableBand **M**ove, identify column, identify new location
Establish a new group	**<F10>** **G**roup **I**nsert, identify location, select type, select field
Add a page break	Type **PAGEBREAK** on its own line at left margin
Print report in report mode	**<F10>** **O**utput; select printer/screen/ file
Print report in main mode	**<F10>** **R**eport **O**utput; select printer, etc.
Save report	**<F2>**

IMPORTING AND EXPORTING TABLES

Import *dBASE* file	**<F10>** **T**ools **E**xportImport **I**mport **D**Base, type path and file name, type table name
Export ASCII delimited file	**<F10>** **T**ools **E**xportImport **E**xport **A**scii **D**elimited, type table name, type path and file name

Note: You can import or export files to *Quattro, 1-2-3, Symphony, dBASE, PFS, Reflex, and VisiCalc*. Also, files can be read or written in ASCII text or delimited form.

For use with PC World Instant Reference Card Portfolio

DEVELOPER'S TOOLBOX

PC-Tags, You're It!

Tom Swan

I don't rave too often, but I'm raving about *PC-Tags* from Moderne Software. Like the dictionary, *PC-Tags* is one of my most heavily used reference tools.

PC-Tags generates an indexed data base of all a program file's subroutines and many data-type declarations. I use it to prepare indexes for Pascal, C, and assembly language, but it can handle BASIC, dBASE, and Modula-2 as well.

After indexing a set of files, I load my editor with code, place the cursor on any procedure, function, or subroutine name, and press **<Ctrl>-A**. In a flash, up pops that routine in a separate window. I can then use my editor's cursor keys to investigate how the code works. This simple hypertextlike capability is tremendously useful in debugging, when I need to understand exactly what a library routine will do, and for browsing public-domain listings when a function call's purpose is unclear.

PC-Tags provides search macros for popular editors including *BRIEF, Epsilon, Multi-Edit, KEdit, Sage,* and *ME.* Because those products search via macros, *PC-Tags* doesn't steal even 1 byte of memory from my editor or compiler.

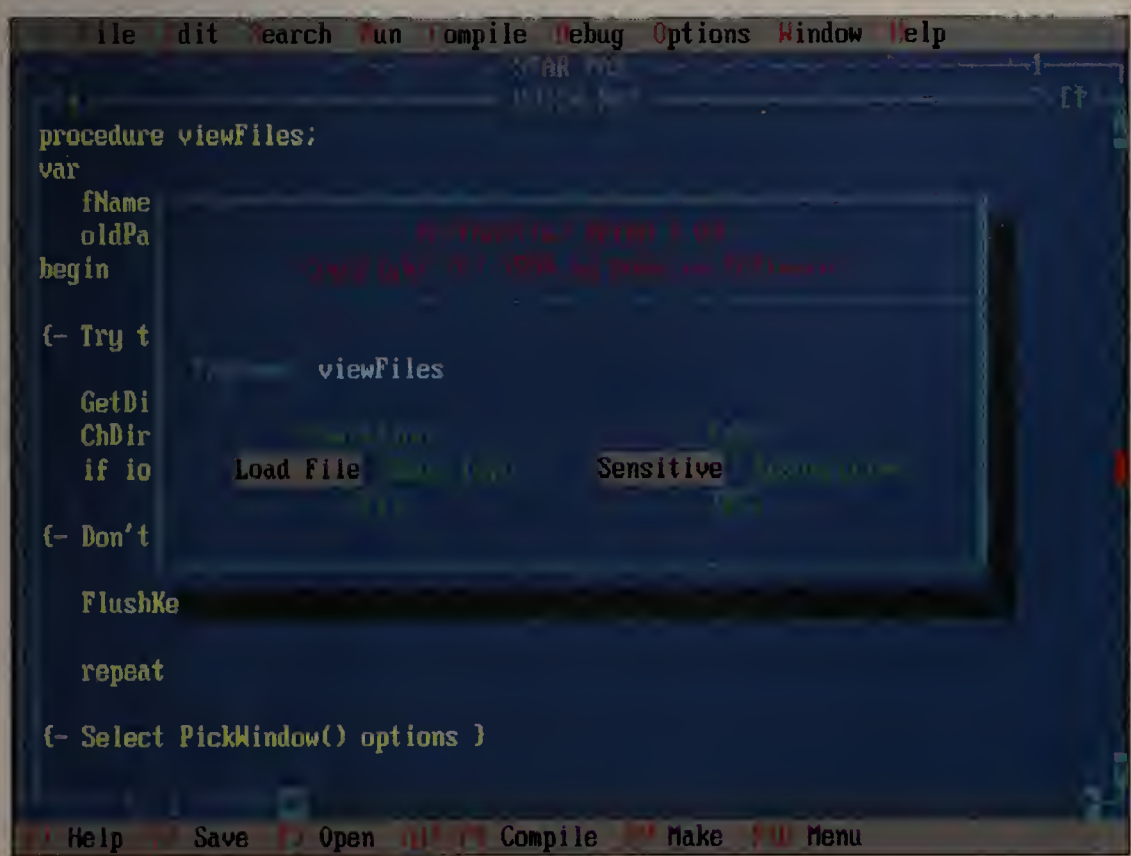
To search directly from DOS, other editors, or integrated environments like *Turbo Pascal* and *Turbo C,* I run a supplied TSR. This technique isn't as good as using a macro, since it takes about 17K, but that's a small sacrifice given *PC-Tags'* benefits as a reference tool.

Speaking of great references, I've grown tired of lugging around the excellent but oh-so-heavy manuals for *Microsoft Windows' Software Development Kit* (*SDK*). Of course, when I'm away from the office I can use the *SDK*'s online help. But searching on line is exasperatingly slow when all I need is a quick reminder.

The *Quick Reference Card for Microsoft Windows 3.0* from Cooper Software took care of that problem and has melted pounds from my luggage. The foldout cardboard accordion lists all 597 *SDK* functions and parameters. I especially like the table of *Windows* messages. The *Quick Reference Card* retails for $14.99, but for a limited time it has an introductory price of $9.99.

Over in the DOS landscape, I'm digging through a mountain of C code in the 46-disk *Library of PD/Shareware C Utilities* from EMS. Although I have other C collections, I'm impressed with this one's quality. Included is a directory in *dBASE III Plus* format, plus a search utility that lets me hunt for files by name, category, vendor, and other fields. With over 400 files covering a wide range of applications such as disk management, data base, communications, and general-purpose programming tools, the EMS library is a bargain hunter's dream.

Let's talk it over. My MCI Mail handle is TSWAN; my CompuServe ID is 73627,3241.



PC-Tags, shown here inside Turbo Pascal 6.0, performs hypertextlike searches of program files.

WHERE TO BUY

Library of PD/Shareware C Utilities
EMS Professional Shareware Libraries
4505 Buckhurst Ct.
Olney, MD 20832
301/924-3594, 301/963-2708 (fax)
LIST PRICE: $79.50 for 5 ¼-inch disks, $94.50 for 3 ½-inch disks
Reader service no. 661

PC-Tags
Moderne Software
3434 Warburton Ave. #10
Santa Clara, CA 95051
408/247-0509
LIST PRICE: $39.95, OS/2 version $69.95
Reader service no. 662

Quick Reference Card for Microsoft Windows 3.0
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3523A Haven Ave.
Menlo Park, CA 94025-1009
415/364-9150, 415/364-0593 (fax)
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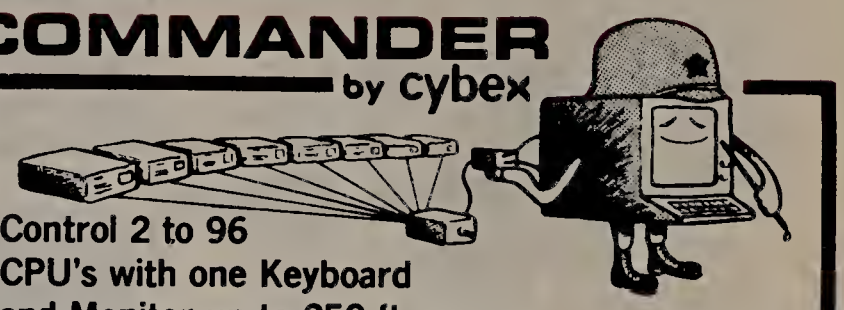

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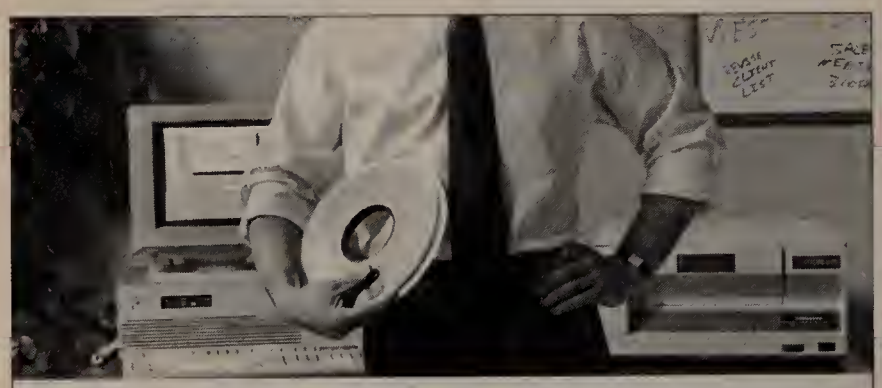

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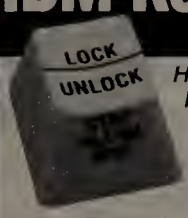

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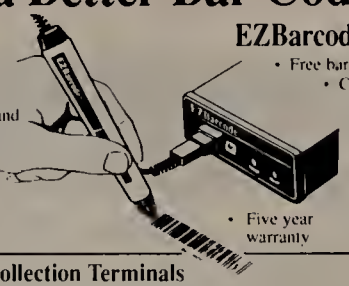

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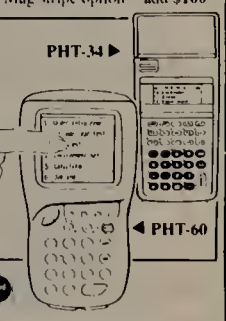

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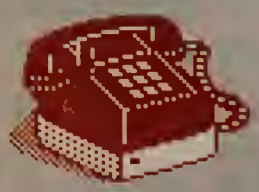

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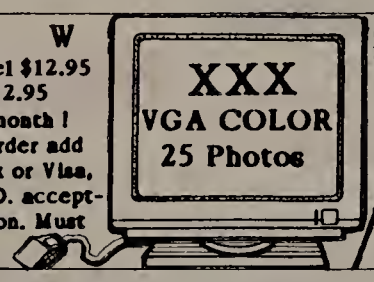

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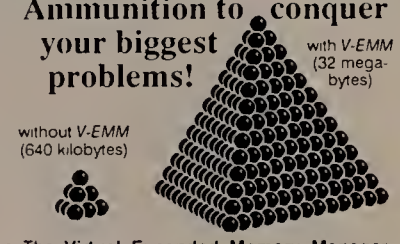

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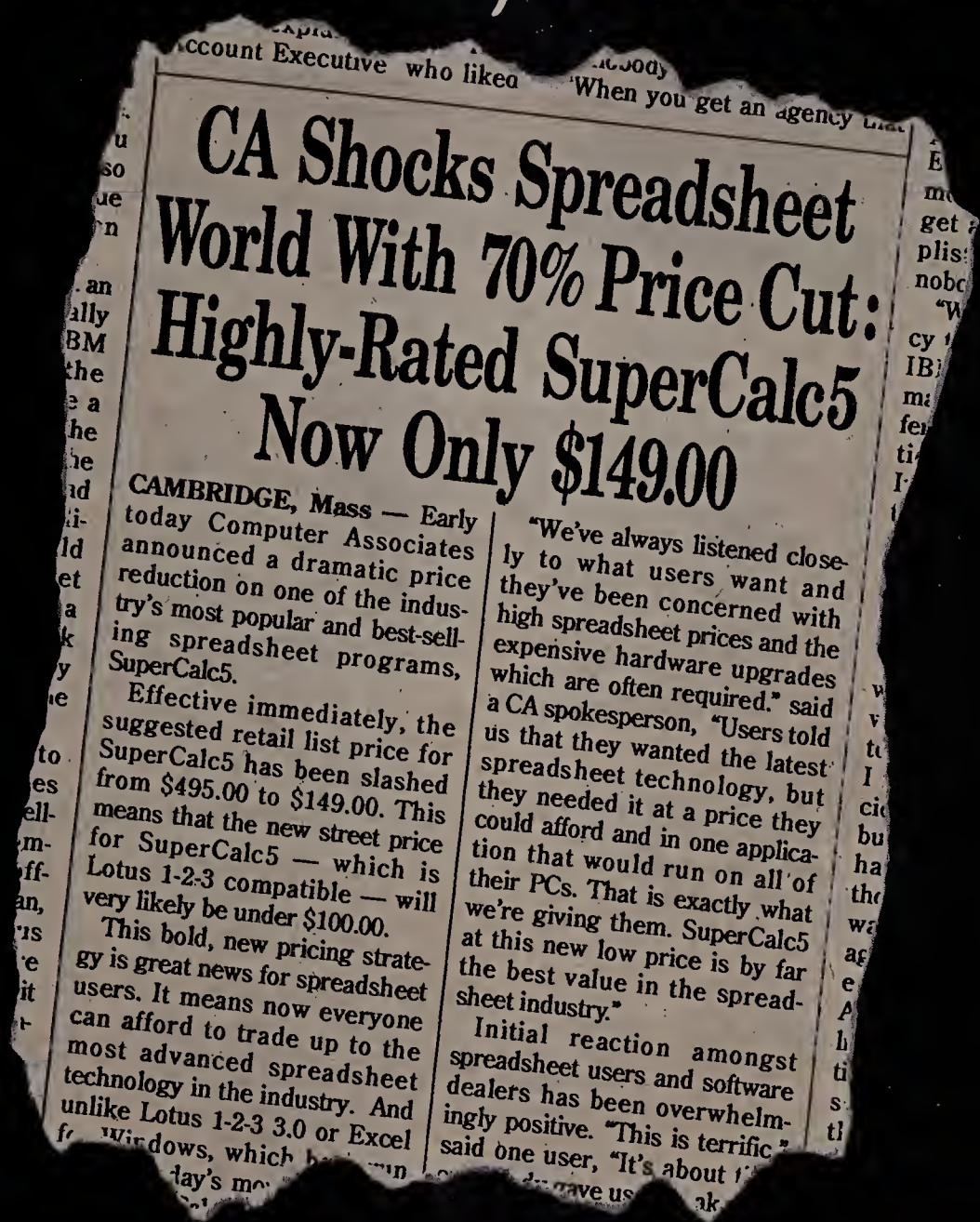

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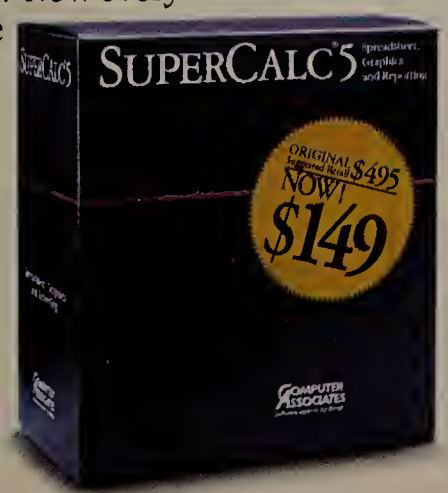

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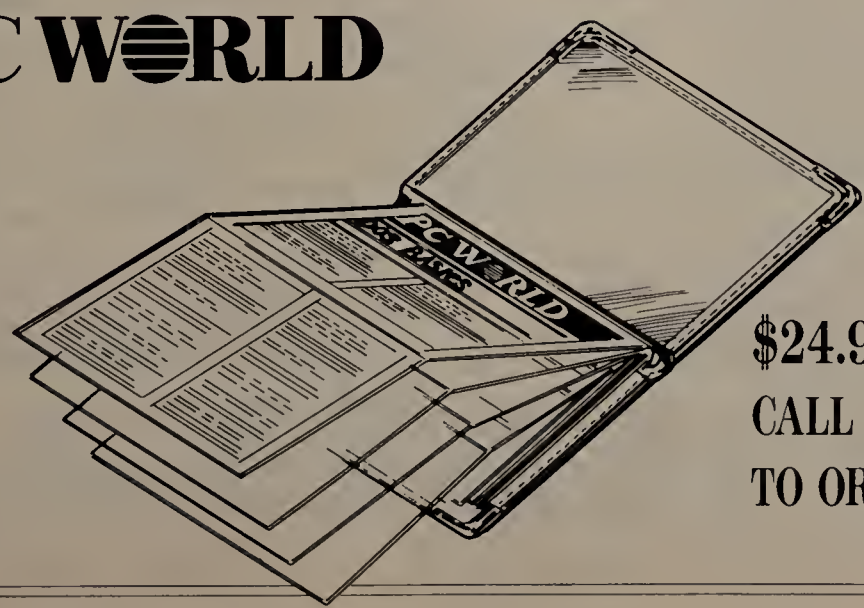

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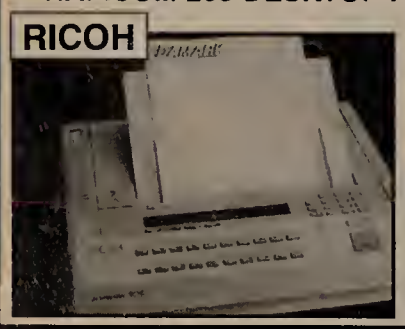

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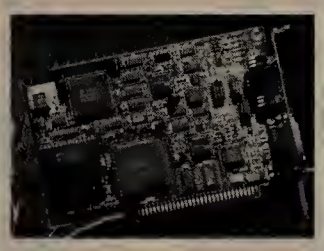

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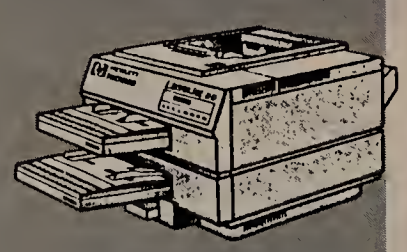

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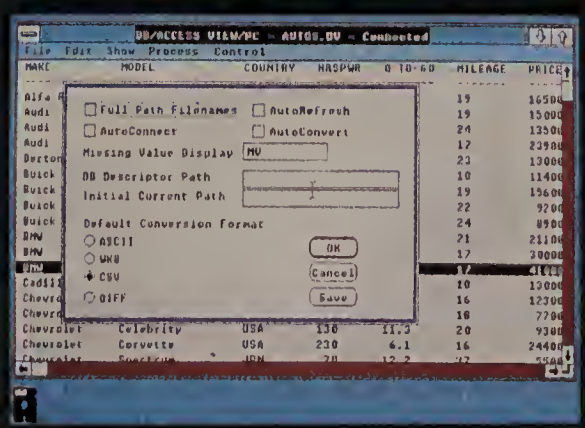

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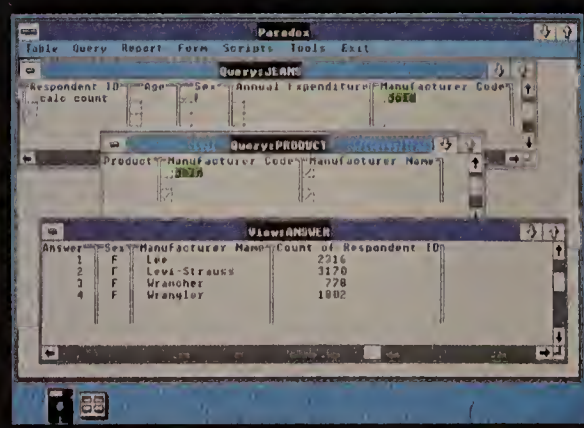

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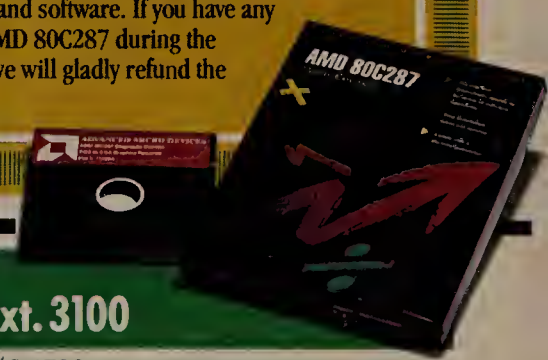

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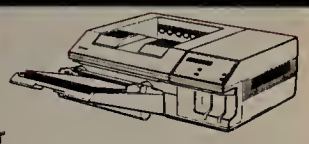

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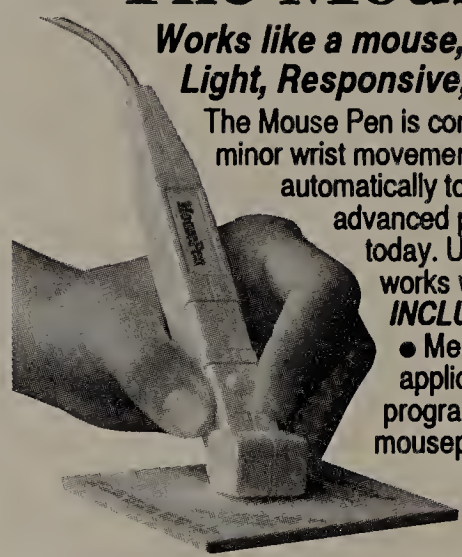

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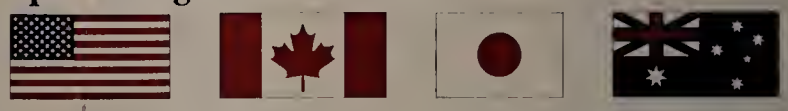

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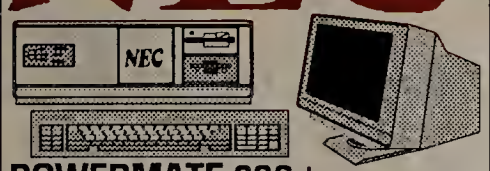

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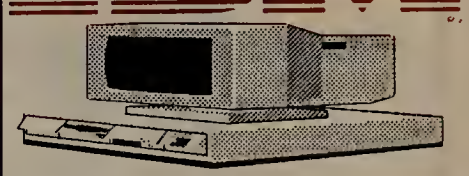

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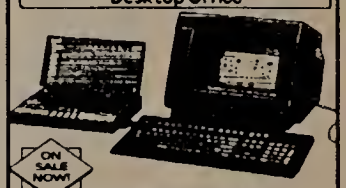

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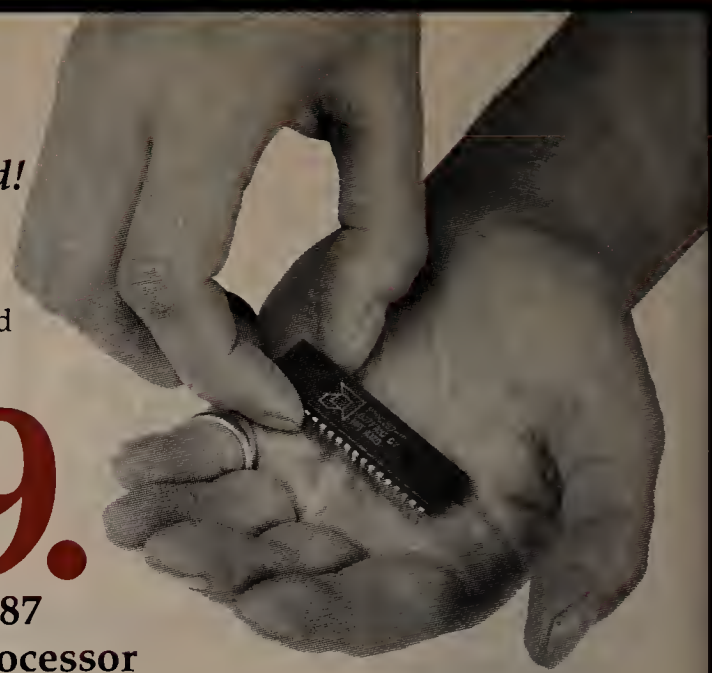

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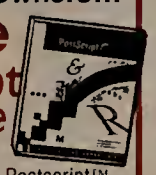

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Premium 486/25T, 25TE,	1Meg	500780-003	WPB	99.00
25, 25E	4Meg	500780-004	WPB	449.00
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Z386/25,20	1Meg	ZA3600ME	115.00
	2Meg	ZA3800MG	179.00
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DeskPro 386/33	2Meg Module	115144-001	149.00
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DeskPro 386/25	1Meg Module	113131-001	89.00
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	1Meg Module	113646-001	89.00
	4Meg Module	112534-001	249.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	169.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	375.00
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T1200XE	2Meg	PC13-PA8306U	149.00
T1600	2Meg	PC8-PA8302U	142.00
T2000SX	1Meg	PC14-PA8316U	179.00
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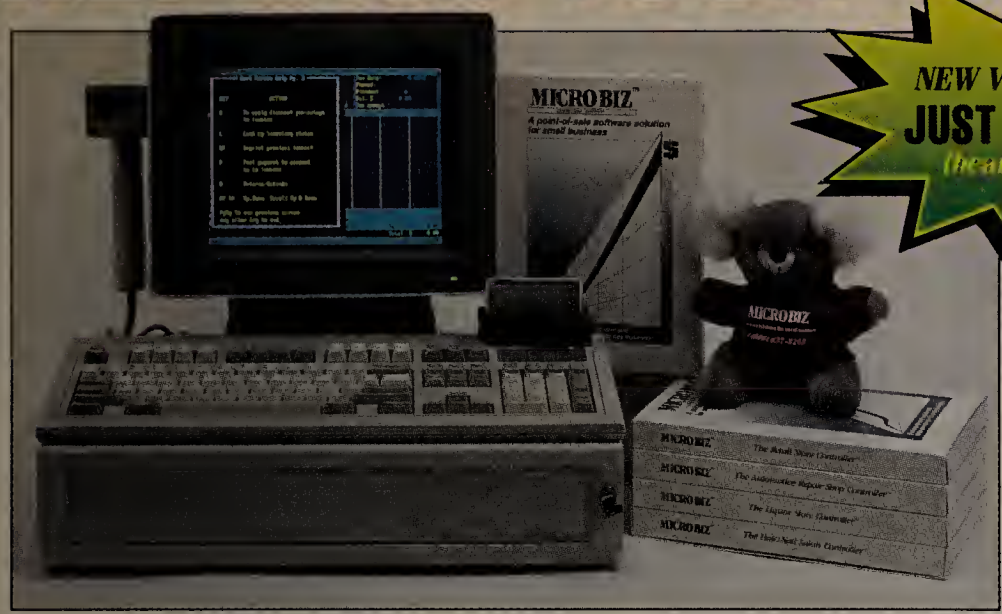

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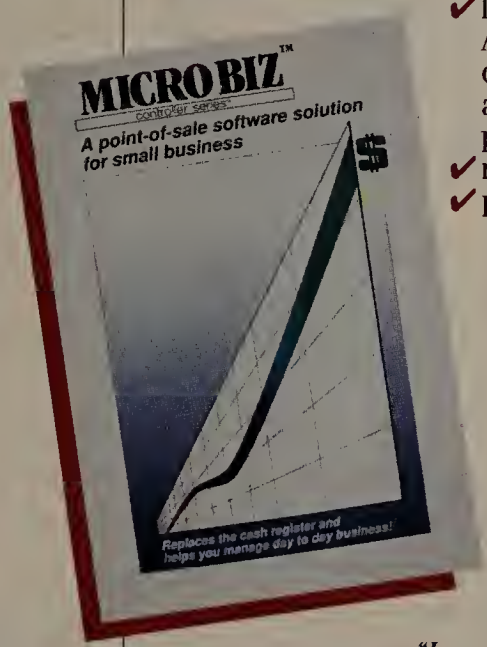

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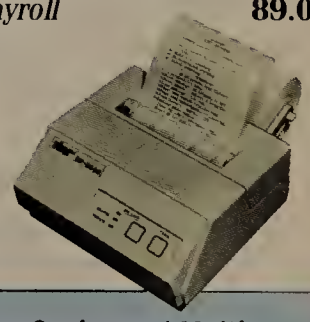

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TAKING IT HOME

The practical guide to home/office computing

More bytes for your buck

Steve Bass

It's harder all the time to get all the software I need on my home machine. Like most people, I have less computer at the house than at the office, and it has to serve the entire family. For example, my wife needs space for *WordPerfect* and some esoteric, megabyte-gobbling scientific software.

I've thought about buying one of those big, fast hard disks. But I didn't want to break down and do something crazy (like spending money) before exhausting every alternative. Besides, it's too much hassle swapping drives and backing up and restoring all those files. Instead, I've found easier and less expensive ways to stretch my old 30MB Seagate and 40MB Plus Development HardCard.

Like so many good things, one of the best space-saving solutions comes from a bulletin board—*PKZIP* and its companion, *PKUNZIP*. The concept is simple: *PKZIP* lets you take rarely used files and make them much smaller. When you need to use them, you decompress them with *PKUNZIP*. You'll see more data compression with text and data base files than with EXE and COM files. These and other shareware archiving programs are available through most user groups and bulletin boards for under $50. But the downside to *PKZIP* is having to *PKUNZIP* files before you access them.

Another shareware program, *PKLITE*, solves that problem. It squeezes EXE and COM program files *and* decompresses them on the fly into memory—pretty slick. Because the files are smaller, they even load more quickly. Generally, the larger the original file, the more you save—my 187K *WordStar* COM file was reduced 21 percent, while my 271K *cc:Mail* program was cut a dramatic 52 percent. Unfortunately, *PKLITE* won't work with programs that have internal overlays, such as *FoxPro;* you're warned before proceeding. But because *PKLITE* is shareware and you can try it before you buy, the financial risk is small.

TROY THOMAS

If you have a little more to spend, you can get still greater compression. *Stacker* is a commercial product that compresses everything on your disk—applications and data—into files on a new, logical drive. Then, *Stacker* compresses and decompresses files so quickly that you aren't even aware that it's working (except for program overlays). On average, *Stacker* gives you a 2:1 compression ratio, effectively doubling your available disk space—great for desktop machines and indispensable for laptops.

Stacker can be bought as software only or as a software/hardware combination. Most people can get by with just software. *Stacker*'s half-size coprocessor card increases access speed, but you'll notice it only on XTs and slower ATs. You can try the software first and add the hardware later. Used as a device driver, *Stacker* takes 21K of RAM versus 30K used as software only; either can be loaded into high memory with a memory manager. Installation was painless, but because my disk was almost full, the compression took about an hour to complete.

PKZIP/PKUNZIP and *PKLITE* are both produced by *PKWare;* too bad there's no way to integrate them to create a single, seamless solution. *Stacker,* on the other hand, offers a complete answer—and with dealer discounts, it will cost you only a little more than the shareware.

Which you select pretty much comes down to how much you want to spend (and how much you like popping the top of your computer). But if you don't take advantage of some kind of disk compression, you could be wasting time, disk space, and money.

Steve Bass is a contributing editor for PC World, *a family therapist, and president of the Pasadena IBM Users Group.*

PKZIP/PKUNZIP $47, **PKLITE** $46; PKWare; 414/354-8699, 414/354-8559 (fax)
Reader service no. 648

Stacker $149 (software only), $229 (software and hardware); Stac Electronics; 800/522-7822, 619/431-7474
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☐ i486-based systems

2. Are you interested in computer products for:
☐ Home ☐ Business ☐ Resale

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4. How many PCs does your company plan to purchase in the next twelve months?

Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
_____	1-3 months	_____	More than 12 months
_____	3-6 months		

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(continued from back page)

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At a time when everybody is cutting budgets, can anyone afford to spend up to an extra $2,950?

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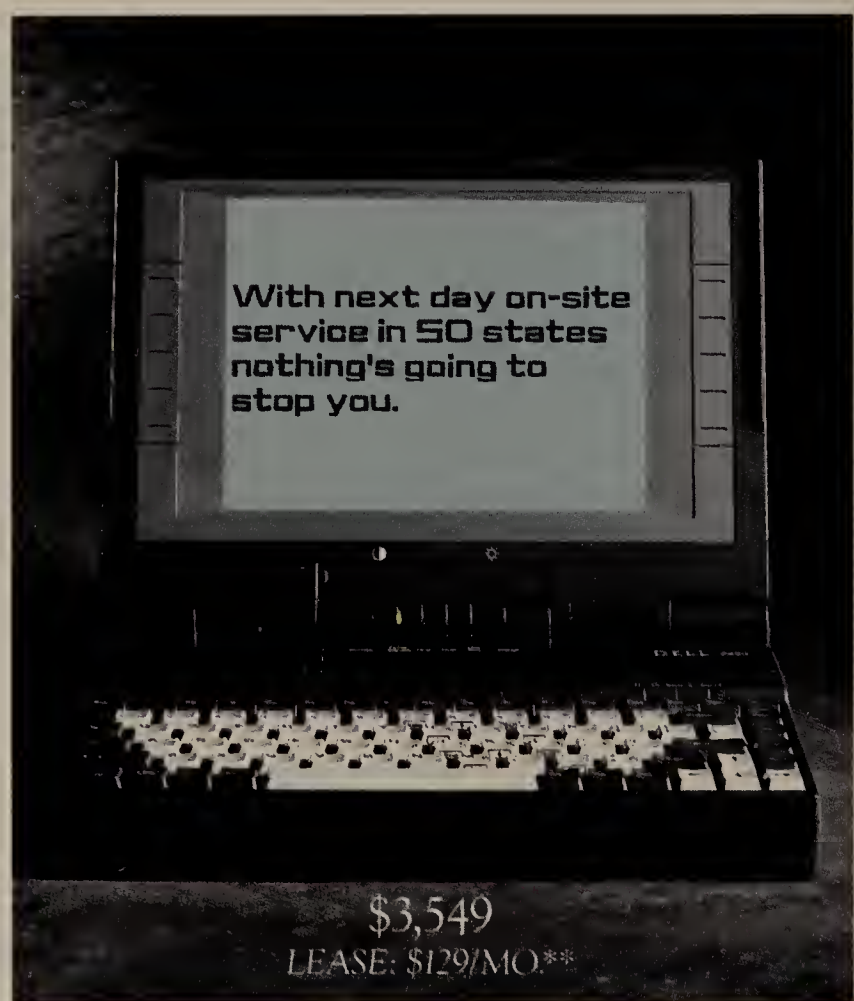

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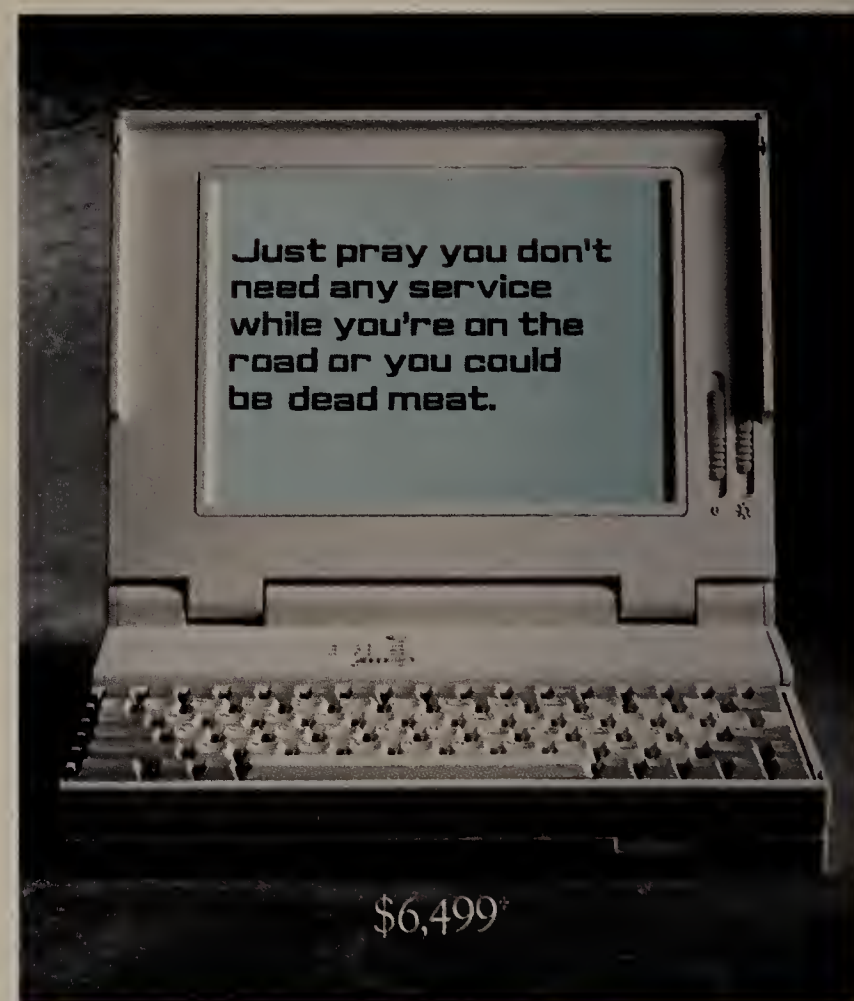

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